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OUTLINE OF COURSES

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Ohio State University Bulletin

Outline of Courses

1912–1913

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COLLEGE OF AGRICULTURE

COURSE IN AGRICULTURE

Degree—Bachelor of Science in Agriculture

Note—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours. For full description of the courses, see corresponding numbers under the departments of instruction.

FIRST YEAR

First Semester		Second Semester	
Chemistry (105 or 109) Inorganic.	4.	Chemistry (106 or 110) Qualitative.	4.
Zoology (101) Invertebrate.	3.	Zoology (102) Vertebrate.	3.
English (101) Paragraph Writing.	2.	English (104) Brief Making.	2.
Animal Husbandry (101) Cattle and Sheep.	4.	Animal Husbandry (102) Horses and Swine.	4.
Drawing (125)	2.	Geology (152)	3.
Shopwork (101)	2.	Shopwork (104)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

First Semester		Second Semester	
Geology (153)	3.	Agronomy (104)	4.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Botany (101)	4.	Botany (102)	4.
Physiology (101)	3.	Physiology (102)	3.
Zoology (107) Entomology.	3.	Zoology (108) Entomolgy	3.
Bibliography (103)	½		
Cadet Service	1.	Cadet Service	1.

THIRD YEAR

First Semester		Second Semester	
Agronomy (106)	4.	Agronomy (101)	4.
Dairying (101)	4.	Horticulture (118)	4.
Modern Language French, German, or Spanish.	4.	Modern Language French, German, or Spanish.	4.
Meteorology (101)	2.		

And one of the following:

Animal Husbandry (103)	4.	Animal Husbandry (104)	4.
Veterinary Medicine (150)	3.	Veterinary Medicine (149)	3.
Forestry (*)	4.	Dairying (102)	4.
Zoology (113) Entomology.	4.	Zoology (114) Entomology	4.
Bacteriology (107)	4.	Bacteriology (110 or 112)	4.
Agricultural Chem. (*)	4.	Agricultural Chem. (*)	4.
Botany (*)	3 or 4.	Botany (*)	3 or 4.
Agronomy (107)	4.	Agronomy (102)	3.
Animal Husbandry (105)	3.	Animal Husbandry (106)	4.
		Meteorology (102)	2.

FOURTH YEAR

First Semester		Second Semester	
American History (101) or Economics (135)	3.	American History (102) or Economics (136)	3.
Rural Economics (103) Farm Management.	4.	Rural Economics (104) Agricultural Economics.	3.

Elective

Ten hours a week throughout the year from any of the courses given in any of the colleges of the University upon which the student is qualified to enter, except the College of Law. Two hours a week of this elective work may be devoted to a thesis, subject to the consent of the instructor under whom the thesis is to be written.

COURSE IN HORTICULTURE

Degree—Bachelor of Science in Horticulture

Note—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours. For full description of the courses, see corresponding numbers under the departments of instruction.

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*Students electing Agricultural Chemistry, Botany, or Forestry in their junior year should consult the department interested regarding the same before being registered.

FIRST YEAR

First Semester		Second Semester	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Inorganic.		Qualitative.	
Zoology (101)	3.	Zoology (102)	3.
Invertebrate.		Vertebrate.	
English (101)	2.	English (104)	2.
Paragraph Writing.		Brief Making.	
Horticulture (101)	4.	Horticulture (102)	4.
Principles.		Principles.	
Drawing (125)	2.	Geology (152)	3.
Shopwork (101)	2.	Shopwork (104)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

First Semester		Second Semester	
Horticulture (103)	3.	Horticulture (104)	3.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Geology (153)	3.	Agronomy (104)	4.
Zoology (107)	3.	Zoology (108)	3.
Economic.		Economic.	
Botany (101)	4.	Botany (102)	4.
Bibliography (103)	½		
Cadet Service	1.	Cadet Service	1.

THIRD YEAR

First Semester		Second Semester	
Horticulture (105)	4.	Horticulture (106)	4.
Modern Language	4.	Modern Language	4.
French, German, or Spanish.		French, German, or Spanish.	
Physiology (101)	3.	Physiology (102)	3.
Botany (125)	4.	Botany (126)	4.
Meterology (101)	2.	Horticulture (108)	3.

FOURTH YEAR

First Semester		Second Semester	
American History (101) or		American History (102)	
Economics (135)	3.	U. S. Political, or	
Horticulture (109)	3.	Economics (136)	3.
Horticulture (107)	3.	Horticulture (110)	3.
		Botany (116)	3.

Elective

Seven hours a week through the year, chosen from any of the courses given in any college of the University upon which the student is qualified to enter, except the College of Law, two hours a week of which may be devoted to thesis, subject to the approval of the department in which the thesis is to be written.

COURSE IN FORESTRY

Degree—Bachelor of Science in Forestry.

Note—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

First Semester		Second Semester	
Chemistry (105) or(109)	4.	Chemistry (106) or (110)	4.
Mathematics (121)	3.	Mathematics (122)	3.
Modern Language (101)	4.	Modern Language (102)	4.
French German, or Spanish		French, German or Spanish.	
English (101)	2.	English (104)	2.
Engineering Drawing (101)	4.	Forestry (102)	2.
Forestry (101)	2,	Elementary.	
Elementary		Botany (110)	2.
		Dendrology.	
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

First Semester		Second Semester	
Botany(101)	4.	Botany (102)	4.
Zoology (109)	3.	Zoology(110)	3.
Entomology.		Entomology.	
Modern Language(103)	4.	Modern Language(104)	4.
French, German, or Spanish.		French, German, or Spanish.	
Civil Engineering (121)	6.	Forestry (104)	3.
Surveying.		Arboriculture.	1.
Bibliography	½.	Geology (152)	3.
Cadet Service	1.	Cadet Service	1.

THIRD YEAR

First Semester		Second Semester	
Forestry (105)	3.	Forestry (106)	3.
Silviculture		Silviculture.	
Botany (117)	4.	Botany (118)	4.
Forest.		Forest.	
Geology (153)	3.	Agronomy (104)	4.
Meteorology (101)	2.	Elementary Soils.	

Not less than five hours throughout the year from the following:

Physics(105)	4.	Physics (106)	4.
Agricultural Chem. (103)	5.	Agricultural Chem. (104)	5.
Bacteriology (107)	4.	Bacteriology (110)	4.
Zoology (113)	4.	Zoology (114)	4.
Engineering Drawing (137)	2.	Engineering Drawing(138)	2.
Economics (135)	3.	Horticulture (108)	3.
Agronomy (107)	4.	Economics (136)	3.

FOURTH YEAR

First Semester		Second Semester	
Foresty (107)	4.	Forestry (108)	4.
Mensuration, Valuation, Wood Technology.		Utilization and Lumbering.	
Forestry (109)	4.	Forestry (110)	4.
History and Management.		Policies and Economics.	
Botany (125)	4.	Botany (126)	4.
Physiological Ecology.		Physiological Ecology.	

Not less than five hours throughout the year from any course offered by the University upon which the student is qualified to enter.

Unless the candidate for a degree has had a full equivalent, not less than one summer of practical work in the woods is required before graduation.

TWO-YEAR COURSE IN AGRICULTURE

Note—The figure in parenthesis following the name of each subjest indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

First Semester		Second Semester	
Animal Husbandry (129)	4.	Animal Husbandry (130)	4.
Horticulture (111)	4.	Horticulture (112)	4.
Shopwork (101)	2.	Shopwork (104)	2.
Agronomy (103)	3.	Agronomy (108)	4.
Chemistry (101)	4.	Chemistry (102 or	
Elementary.		Agricultural Chem. (102)	4.
		Soil Fertility	
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

First Semester		Second Semester	
Agronomy (105)	4.	Rural Economics (102)	4.
Dairying (109)	4.	Dairying (102)	4.
Elementary		Farm Dairying	
Cadet Service	1.	Cadet Service	1.

And two subjects each semester chosen from the following;

Veterinary Medicine (149)	3.	Veterinary Medicine (150)	3.
Animal Husbandry (123)	4.	Animal Husbandry (128)	4.
Dairy Cattle		Feeding and Breeding.	
Horticulture (113)	4.	Horticulture (114)	4.
Pomology.		Pomology.	
Zoology (109)	4.	Zoology (110)	4.
Entomology.		Entomology.	
Physiology (103)	3.	Bacteriology (104)	3.
Mathematics (103)	5.	Mathematics (104)	5.
Algebra.		Botany (102)	4.
Physics (101)	6.	Elementary.	
Forestry ( )	3.	Geology (162)	4.
		Physical Geography.	

TWO-YEAR COURSE IN HORTICULTURE

FIRST YEAR

First Semester		Second Semester	
Horticulture (111)	4.	Horticulture (112)	4.
Zoology (109)	4.	Zoology (110)	4.
Entomology.		Entomology.	
Shopwork (101)	2.	Shopwork (104)	2.
Chemistry (101)	4.	Chemistry (102) or	
Elementary,		Agricultural Chem. (102)	4.
Agronomy (103)	4.	Soil Fertility.	
		Botany (112)	4.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

First Semester		Second Semester	
Horticulture (113)	4.	Horticulture (114)	4.
Pomology.		Pomology.	
Horticulture (115)	4.	Horticulture (116)	4.
Agronomy (105)	4.	Rural Economics (102)	4.
Cadet Service	1.	Cadet Service	1.

One of the following:

Forestry	4.	Horticulture	4.
Mathematics (103)	5.	Mathematics (104)	5.
Algebra.		Bacteriology (104)	3.
Physics (101)	5.	Geology (162)	4.
Physiology (103)	3.	Physical Geography.	

APPRENTICE'S TWO-YEAR COURSE IN ANIMAL HUSBANDRY

This is essentially the same as the regalar two-year course in Agriculture, but is especially arranged for students who wish to specialize in Animal Husbandry work. The course includes two years at the University and two years on stock farms. Through arrangement with the Department, specially qualified men may take this course. They will spend the first year at the University; the second will be devoted to practical training on stock farms by arrangement of the Department, pay being given for the service; the third year will be at the University, and the fourth year on other stock farms. Some of the leading stockmen of Ohio and other States have agreed to co-operate in arranging this course.

Not over 50 matriculants will be permitted to enroll, and each person must receive the written authority of the Animal Husbandry Department before being registered. No changes or substitutions will be permitted, and each person taking the work must agree to take take the practical farm work as given in the course.

OUTLINE OF THE COURSE

Note—The figure in parenthesis following the name of each subject indicates the number of that subject in its department; the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

First Semester		Second Semester	
Types and Market Classes (101) Cattle and Sheep.	4.	Types and Market Classes (102) Horses and Swine.	4.
Animal Husbandry (125) Feeding Animals.	3.	Animal Husbandry (128) Breeding Animals.	3.
Agronomy (103)	4.	Agronomy (108)	4.
Chemistry (101)	4.	Agricultural Chem. (102)	4.
Shopwork (101)	2.	Shopwork (104)	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

At least 300 days' service on an accredited stock farm, the student to be placed thereon by arrangement with the Department of Animal Husbandry.

THIRD YEAR

First Semester		Second Semester	
Animal Husbandry (129)	4.	Animal Husbandry (130)	4.
Poultry Husbandry	2.	Meats and Meat Products (110)	1.
Zoology (109)	4.	Veterinary Medicine (149)	4.
Veterinary Medicine (150)	4.	Bacteriology (104)	3.
Physiology (103)	3.	Botany (112)	4.
Rural Economics (101)	2.	Agricultural Economics	3.

FOURTH YEAR

At least 300 days' service as during the second year, though on a different farm or farms from that year will be required. At end of fourth year, with a satisfactory record, the student will be granted an Apprentice's Certificate in Animal Husbandry.

COURSE IN DOMESTIC SCIENCE

OUTLINE OF THE COURSE

Degree—Bachelor of Science in Domestic Science

Note—The figure in parenthesis following the name of each subject indicates the number of that subject in its department, the other figure the number of credit hours. For full description of courses, see corresponding number under the departments of instruction.

FIRST YEAR

First Semester		Second Semester	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Art (101)	2.	Art (102)	2.
English (101)	2.	English (104)	2.
Zoology (101) or Botany (101)	3 or 4.	Zoology (102) or Botany (102)	3 or 4.
Modern Language (101) French or German.	4.	Modern Language (102) French, or German.	4.
Domestic Art (101) Hand Craft.	2.	Domestic Art (102) Textiles.	2.
Physical Training	1.	Physical Training	1.

SECOND YEAR

Chemistry (127) Organic.	5.	Agriculture Chem. (123)	5.
Domestic Science (101)	4.	Domestic Science (102)	4.
Physiology (101)	3.	Physiology (102)	3.
Modern Language (103) French or German.	4.	Modern Language (104) French or German.	4.
Engineering Draw. (127)	1½.	Engineering Draw. (128)	1½.
Bibliography (103)	½.		
Physical Training	1.	Physical Training	1.

THIRD YEAR

First Semester		Second Semester	
Economics (138)	5.	Sociology (122)	5.

Group A

Bacteriology (107)	3 to 5.	Domestic Science (104)	3.
Agricultural Chem. (124)	5.	Domestic Science (103)	4.

Group B

Art (105)	2.	Art (106)	2.
Domestic Art (103)	3.	Domestic Art (104)	3.

Either Group A or Group B may be chosen; one must be taken and both may be. Enough work must be elected with Group A or Group B to make fifteen hours.

FOURTH YEAR

Group A

First Semester		Second Semester	
Domestic Science (105)	2.	Domestic Science (106)	3 to 5.
Domestic Science (107)	3.		

Group B

Philosophy (183)	2.	Philosophy (184)	2.
Art (119)	1.	Art (120)	1.

Enough work must be taken with Group A or Group B, or both, to total not less than fifteen hours.

COLLEGE OF ARTS, PHILOSOPHY AND SCIENCE

This College comprises those courses of study that are designed to furnish a liberal education in the languages and literatures, the sciences, mathematics, philosophy, history, politics, economics, sociology, and preparation for commerce, law, medicine, philanthropic work, administration, and journalism.

DEPARTMENTS

The College includes work in the following departments: American History, Anatomy and Physiology, Astronomy, Bacteriology, Botany, Chemistry, Economics and Sociology, English, European History, Geology, German, Greek Language and Literature, Latin Language and Literature, Mathematics, Military Science and Tactics, Philosophy, Physical Education, Physics, Political Science, Psychology, Romance Languages and Literatures, Zoology and Entomolgy. The following departments also offer a limited amount of work as elective studies in the College of Arts, Philosophy and Science: Architecture, Art, Civil Engineering, Domestic Science, Engineering Drawing, Electrical Engineering, History and Philosophy of Education, Mechanical Engineering, Mechanics, Metallurgy and Mineralogy.

REQUIREMENTS FOR GRADUATION

The Group Elective System

The work of the College of Arts, Philosophy and Science is organized on the group elective system. About one-third of every student's curriculum is prescribed by the regulations given below. Each student is required to lay sufficiently broad foundations in English, other languages, the sciences, history, or economics, and in mathematics, philosophy, or psychology. The remaining two-thirds of the student's work is elective.

On satisfactory completion of 120 semester hours under the regulations prescribed below, the student will be recommended for the degree of Bachelor of Arts.

The departments in which credit may be obtained are arranged in the following four groups:

(A) Languages and Literatures

English, German, Greek Language and Literature, Latin Language and Literature, Romance Languages and Literature.

(B) Natural Sciences

Anatomy and Physiology, Astronomy, Bacteriology, Botany, Chemistry, Geology, Physics, Zoology and Entomology.

(C) Social Sciences

American History, Economics and Sociology, European History, Political Science.

(D) Mathematics—Philosophy

Mathematics, Philosophy, Psychology.

COURSES OPEN TO FRESHMEN

English 101-104, 2 credit hours; English 131-134 (or 132-133), 3 credit hours.

French 101-102, 4 credit hours; French 103-104 (for students who enter with two units in French), 4 credit hours.

German 101-102, 4 credit hours; German 103-104 (for students who enter with two units in German), 4 credit hours.

Greek 101-102, 4 credit hours; Greek 105-106 (for students who enter with two units in Greek), 4 credit hours.

Latin 101-102 (for students who enter with three or four units in Latin), 4 credit hours.

Spanish 101-102, 4 credit hours; Spanish 103-104 (for students who enter with two units in Spanish), 4 credit hours.

Botany 101-102, 4 credit hours.

Zoology 101-102, 3 credit hours.

Astronomy 101-102, 3 credit hours.

Chemistry 105-106, 4 credit hours; Chemistry 109-110 (for students who enter with one unit in Chemistry), 4 credit hours.

Geology 101-102, 3 credit hours.

Physics 103-104, 4 credit hours; Physics 105-106 (for students who enter with one unit in Physics), 4 credit hours.

American History 101-102, 3 credit hours.

Economics 131-134, 3 credit hours.

European 101-102, 3 credit hours.

Mathematics 121-122, 3 credit hours; Mathematics 131-132, 5 credit hours; Mathematics 123-124, 1 credit hour.

Philosophy 101-102, 3 credit hours.

Psychology 101-102, 3 credit hours.

Drill; Gymnasium.

REGULATIONS

(1) Cadet service is required of all men during the first and second years.

Physical Education is prescribed for all men during the first year and for all women during the first and second years.

(2) English 101-104 is to be taken by all students, ordinarily in the first year.

(3) In each of the four groups named above the student must secure credit for at least six semester hours (a year course), this requirement to be satisfied in the first and second years.

(4) Sixteen hours of credit in languages other than English are required. But for students who enter with six units of credit in languages other than English, the college requirement is eight instead of sixteen hours. In high school and college together the student must have credit in at least two languages other than English.

(5) Every student is required (a) to secure credit for at least six semester hours in a biological science (Botany, Physiology, or Zoology), and (b) at least six semester hours in a non-biological science (Astronomy, Chemistry, Geology or Physics). But students who are credited on admission with one unit in Botany or one unit in Zoology are excused from requirement (a) and students who are credited on admission with both one unit in Chemistry and one unit in Physics are excused from requirement (b).

(6) At least 36 of the 120 hours required for the degree must be in some one group, and at least 18 in some other one group. In no one of the groups may more than 60 hours be credited for the degree, exclusive of the requirement made in Regulations 2, 3, 4, and 5 above.

(7) At least 36 of the 120 hours required for the degree must be in courses not open to Freshman.

(8) Courses open to Freshman, if elected by Seniors, give credit diminished by one hour.

(9) Each year's work must consist of 15 or 16 hours work each semester. On petition to the Executive Committee a student who shows exceptional proficiency may take from one to three extra hours, but in no case will more than 18 hours be permitted. No extra hours will be granted to a first-year student or to a student having conditions outstanding in his Entrance or College record.

THE ARTS-LAW COURSE

Students desiring the degree of Bachelor of Arts in the College of Arts, Philosophy and Science, and the degree of Bachelor of Laws in the College of Law, may, by complying with the regulations below obtain the two degrees in six years.

On satisfactory completion of the three years' work, comprising ninety-six semester hours, in the College of Arts, Philosophy, and Science, and the first year of the course in the College of Law of this University, under the usual regulations governing work in each of the two colleges (except as indicated below), the student will be recommended for the degree of Bachelor of Arts.

All regulations applying to students in the College of Arts, Philosophy and Science apply in the combined Arts-Law course except as modified by the following statements:

1. No student is eligible for the combined Arts-Law course who has not been a student in the College of Arts, Philosophy and Science of this University at least one full year.

2. At least thirty-six of the ninety-six semester hours of Arts College subjects required for the degree in Arts must be in the Social Sciences Group and eighteen in some other one group. Of the work in the Social Sciences Group, at least eighteen hours must be in advanced courses. In no one of the groups may more than forty hours be credited for the degree, exclusive of the requirements made in Regulations 2, 3, 4 and 5.

3. At least thirty-six of the ninety-six hours of Arts College subjects required for the degree must be in courses not open to freshmen.

4. Business Law (Economics 143) may not be counted towards the degree in the combined Arts-Law course.

5. In order to have the first year of the Course in Law counted toward the Arts degree, the student must have maintained a uniform record of good scholarship in the College of Arts, Philosophy and Science and have completed the entire requisite ninety-six hours of work in that College before the work in the College of Law is entered upon.

6. Application for the privilege of the course must be filed with the Registrar not later than June 1, of the year preceding the student's proposed entrance upon the work in the Law College. The question of the applicant's eligibility to the combined course will be determined by the Executive Committee of the Arts College.

No credit in the College of Arts, Philosophy and Science will be given for work done in the College of Law except as above provided, but regular fourth-year students in the former College may, by special permission, take a limited amount of the work in the College of Law without credit in the College of Arts, Philosophy and Science.

The work of all students taking studies in the two colleges at the same time is under the jurisdiction of a joint committee, consisting of Professor Denney, Dean of the College of Arts, Philosophy, and Science; Professor Adams, Dean of the College of Law; Professors Siebert, Page and Bruce.

THE ARTS-EDUCATION COURSE

Two Degrees

Students who have received credits for one hundred and forty hours and who have met all requirements, both for a degree in the College of Arts, Philosophy and Science, and for a degree in the College of Education, will be granted the degree of Bachelor of Arts by the former college and the degree of Bachelor of Science in Education by the latter college. Applicants for both degrees must register in both colleges.

THE ARTS-ENGINEERING COURSE

The entrance requirements for the combined course shall be the same as for the College of Arts except that one unit of Physics is required.

A candidate for the degree of Bachelor of Arts, while registered in the College of Arts, Philosopy and Science, may also register in the College of Engineering, provided that at the time of seeking such registration in the College of Engineering he has ninty semester hours to his credit in the College of Arts, Philosopy and Science, exclusive of the credit hours in Military Drill and Physical Education, and including the following subjects:

Mathematics, 131, 132, 141, 142, 20 hours; Chemistry, 105 and 106, or 109 and 110, 8 hours; Modern Language, French, German or Spanish, 16 hours; English 101 and 104, 4 hours; Social Science, 6 hours; Biological Science, 6 hours; Physics, 113 and 114, 10 hours; Engineering Drawing, 101 and 102, 5 hours; Arts Electives, 15 hours; total, 90 hours.

Eighty semester hours of the above work shall be exclusive of those subjects published in the appendix of this bulletin.

When the candidate has obtained 124 semester hours in the two colleges exclusive of Military Drill and Physical Education, 100 semester hours of which shall be subjects accepted by the Arts College, and exclusive of those published in the appendix of the Arts College bulletin, the candidate shall receive the degree of Bachelor of Arts. This will ordinarily be at the end of one year's residence in the College of Engineering. At least six semester hours, other than Mechanics, of the above mentioned 100 hours, must have been earned during the first year of residence in the College of Engineering. At the end of two more years, by doing the regular amount of work, the candidate will have completed the requirements of any one of the Engineering pegrees, and will be recommended for the appropriate degree.

COLLEGE OF EDUCATION

This College is one of the instrumentalities of the State for the training of teachers. It offers practical and theoretical courses for the professional training of high school teachers and principals, of principals of elementary schools, of supervisors of special studies, of superintendents of school systems, and of instructors in normal schools. Its purpose is to assist the student in the acquirement of a knowledge of the branches which he wishes to teach, to give him a right attitude toward education, and to establish in him a skill in the use of efficient methods of teaching.

The effort of the college is to bring into proper adjustment within the limits of a four-year course the academic training, the theoretical professional training, and the practical professional training necessary for a proficient teacher. A reference to the outline of courses will reveal the adjustment for teachers of various branches of study.

CURRICULA

Two general classes of curricula have been provided, both of which lead to the degree of Bachelor of Science in Education.

The first of these provides a wide range of electives and seeks to train superintendents, and high school teachers. While the courses are definite and fixed, the student may choose from a number of studies the major branch which he expects to prepare to teach. Correlated with this will be other branches which he may teach.

The second class provides fixed courses which permit of very little election, the study being for the definite purpose of preparing teachers and supervisors in art, manual training and domestic science.

Upon entering the University, all students preparing to teach should consult the Dean of the College of Education regarding the arrangement of their work.

ARRANGEMENT OF COURSES

Excepting the courses in art, manual training, and domestic science, the work of the first two years must include:

(a)	English 101 and 104.	(2-2) 4 hours.
	English 131 and 132.	(3-3) 6 hours.

(b) One of the following languages which must be pursued through both the first and second years: (4-4)

Greek Latin French German Spanish	(4-4) 10 hours

(c) Mathematics 121-122: (3-3) 6 hours, or if Mathematics is elected the major subject, 131-132: (5-5) 10 hours.

One of the following:	(4-4) 8 hours.
	or (3-3) 6 hours.

Non-biological
  Physics 105-106 or 103-104;
  Chemistry 105-106 or 109-110;
  Geology 101-102;
  Astronomy 101-102.

Biological
  Physiology 101-102;
  Zoology 101-102;
  Botany 101-102.

The student is required to have either entrance of college credit for both a biological and non-biological science. If the student does not offer Physics or Chemistry for entrance credit, one of these subjects must be taken in the University.

(e) One of the following: American History 101-102; European History 101-102.	(3-3) 6 hours.
(f) Psychology	(3-3) 6 hours.

The work of the third and fourth years must include:

(1) Fundamental Courses:
  History of Education not less than 6 hours.
  Elements of Sociology not less than 6 hours.

(2) Professional Courses:
  The Principles and Practise of Teaching, not less than 6 credit hours. Some credit for this work may be given to experienced teachers.
  School Administration, not less than 6 hours.

(3) Major Courses:
  The work which the student is preparing to teach (elected in the first or second year)—hours enough to satisfy the professor in charge that the scholarship warrants a recommendation for teaching in a secondary school.
  A course in the teaching of the major subject, if offered.

OUTLINE BY YEARS

FRESHMAN YEAR

(a) Fifteen or sixteen hours each semester, chosen from the prescribed work indicated above, including English, 101, 104.

(b) Cadet Service and Physical Education (men), Hygiene and Physical Training (women); required throughout the Freshman year.

SOPHOMORE YEAR

(a) Fifteen hours each semester. This must include English 131-132 and Psychology 101-102, and all other prescribed work not done in the Freshman year; the other work must be done in that branch of study which the student is preparing to teach.

(b) Cadet Service (men). Hygiene and Physical training (women); required throughout the sophomore year.

JUNIOR YEAR

Fifteen hours each semester. This must include the major subject with a credit of five hours each semester; Sociology, six credit hours; History of Education, six credit hours; and elective work closely rated to the major work, four credit hours.

SENIOR YEAR

Fifteen hours each semester. This must include school administration, six credit hours; observation of and practise in teaching, six credit hours; the work the student is preparing to teach, five credit hours; and electives, four credit hours.

REQUIREMENTS FOR A DEGREE

Upon the satisfactory completion of one hundred and twenty semester hours under the restrictions and requirements prescribed above, the student will be recommended for the degree of Bachelor of Science in Education.

TWO DEGREES

Students who have received credits for one hundred and forty hours and who have met all requirements, both for a degree in the College of Arts, Philosophy and Science,and for a degree in the College of Education, will be granted the degree of Bachelor of Arts by the former college and the degree of Bachelor of Science in Education by the latter college. Applicants for both degrees must register in both colleges.

GENERAL COURSE

FIRST YEAR

First Semester		Second Semester	
English (101)	2.	English (104)	2.
Group (*b*)	4.	Group (*b*)	4.
Group (*c*)	3.	Group (*c*)	3.
Group (*d*)	4.	Group (*d*)	4.
Group (*e*)	3.	Group (*e*)	3.

SECOND YEAR

English (131)	3.	English (134)	3.
Psychology (101)	3.	Psychology (102)	3.
Group (*b*)	4.	Group (b)	4.
Major Work	5.	Major Work	5.

THIRD YEAR

Sociology (101)	3.	Sociology (102)	3.
History of Education (101)	3.	History of Education (102)	3.
Major Work	5.	Major Work	5.
Correlated Work	4.	Correlated Work	4.

FOURTH YEAR

Principles and Practise of Education (101)	3.	Principles and Practise of Education (104)	3.
School Administration (101 or 111)	3.	School Administration (102 or 112)	3.
Major Work	5.	Major Work	5.
Elective	4.	Elective	4.

The major work is pursued in the branch of study which the student is preparing to teach. The correlated work will be found in some branch closely allied to the major work and which the student may also elect to teach.

COURSE IN ART

FIRST YEAR

First Semester		Second Semester	
English (101)	2.	English (104)	2.
Foreign Language	4.	Foreign Language	4.
Art (101)	2.	Art (102)	2.
Art (103)	2.	Art (104)	2.
Zoology (101) or Botany (101)	3 or 4.	Zoology (102) or Botany (102)	3 or 4.
Elective	3.	Elective	3.
Military Drill	1.	Military Drill	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

English (131)	3.	English (132)	3.
Psychology (101)	3.	Psychology (102)	3.
Foreign Language	4.	Foreign Language	4.
Physiology (119)	3.	Physiology (120)	3.
Art (105)	2.	Art (106)	2.
Art (111)	2.	Art (112)	2.
Military Drill	1.	Military Drill	1.

THIRD YEAR

Sociology (101)	3.	Sociology (102)	3.
Psychology (107)	2.	Psychology (108)	2.
Art (109)	3.	Art (110)	3.
Art (115)	3.	Art (116)	3.
Engineering Drawing (131)	3.	Engineering Drawing (132)	3.
Elective	2.	Elective	2.

FOURTH YEAR

History of Education (101)	3.	History of Education (102)	3.
Principles and Prac. (101)	3.	Principles and Prac. (102)	3.
Art (113)	3.	Art (114)	3.
Art (117)	4.	Art (118)	4.
Elective	3.	Elective	3.

COURSE IN DOMESTIC SCIENCE

FIRST YEAR

First Semester		Second Semester	
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Art (101)	2.	Art (102)	2.
English (101)	2.	English (104)	2.
Zoology (101) or Botany (101)	3 or 4.	Zoology (102) or Botany (102)	3 or 4.
French or German	4.	French or German	4.
Domestic Art (101)	2.	Domestic Art (102)	2.
Physical Training	1.	Physical Training	1.

SECOND YEAR

Chemistry (127)	5.	Agricultural Chem. (123)	5.
Domestic Science (101)	4.	Domestic Science (102)	4.
Psychology (101)	3.	Psychology (102)	3.
French or German	4.	French or German	4.
Engr. Drawing (127)	1½.	Engr. Drawing (128)	1½.
Physical Training	1.	Physical Training	1.

THIRD YEAR

Physiology (101)	3.	Physiology (102)	3.
Psychology, Ed. (107)	2.	Psychology, Ed. (108)	2.
Economics (138)	5.	Sociology (122)	5.

Either Group A or B must be taken; both may be.

Group A

Bacteriology (107)	3.	Domestic Science (104)	3.

Group B

Art (105)	2.	Art (106)	2.
Domestic Art (103)	3.	Domestic Art (104)	3.

If only one group is taken, enough work, including English 131 and 132, must be elected to make fifteen hours each semester.

FOURTH YEAR

Sociology (101)	3.	Sociology (102)	3.
History of Education (101)	3.	History of Education (102)	3.
Prin. and Prac. of Ed. (101)	3.	Prin. and Prac. of Ed. (102)	3.

Either Group A or Group B must be taken.

Group A

Domestic Science (105)	2.	Domestic Science (106)	3-5.
Domestic Science (107)	3.	Domestic Science (108)	3.

Group B

Art (119)	1.	Art (120)	1.
Domestic Art (105)	3.	Domestic Art (106)	3.
Elective	2-4.	Elective	2-4.

COURSE IN MANUAL TRAINING

FIRST YEAR

First Semester		Second Semester	
English (101)	2.	English (104)	2.
French or German	4.	French or German	4.
Chemistry (105 or 109)	4.	Chemistry (106 or 110)	4.
Mathematics (121)	3.	Mathematics (122)	3.
Drawing (101)	2.	Drawing (102)	3.
Art (103)	2.	Art (104)	2.
Military Drill	1.	Military Drill	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

English (131)	3.	English (132)	3.
French or German First year language continued	4.	French or German First year language continued	4.
Psychology (101)	3.	Psychology (102)	3.
Art (105)	2.	Art (106)	2.
Shopwork (109) Woodworking	2.	Shopwork (114) Cabinetmaking.	2.
Drawing (103)	2.	Shopwork (116) or Forging.	
		Manual Training (102)	2.
		Military Drill	1.

THIRD YEAR

Physics (103)	4.	Physics (104)	4.
Sociology (101)	3.	Sociology (102)	3.
Psychology (107)	2.	Psychology (108)	2.
Manual Training (103)	3.	Manual Training (104)	3.

Either Group A or Group B must be elected.

Group A

Shopwork (105) Foundry.	2.	Shopwork (118) Advanced Forging.	2.
Shopwork (119) or Elementary machines.		Shopwork (122) or Advanced machines.	
Wood-Turning and Pattern Making (129)	3.	Wood-Turning and Pattern Making (130)	3.

Group B

Manual Training (107)	2.	Manual Training (108)	2.
Manual Training (105)	3.	Manual Training (106)	3.

FOURTH YEAR

History of Education (101)	3.	History of Education (102)	3.
Principles and Prac. (101)	3.	Principles and Prac. (102)	3.
Teaching of Manual Training (111)	3.	Materials, Methods, and Equipment (112)	3.
Elective	3 to 5.	Elective	3 to 5.

Also Group A or Group B must be elected.

Group A

Shopwork (123) or Machine		Shopwork (126 or 128) or Machine.	
Shopwork (131) Cabinet.	3.	Shopwork (132) Cabinet.	3.

Group B

Manual Training (115)	3.	Manual Training (116)	3.

COURSE IN AGRICULTURAL EDUCATION

FIRST YEAR

First Semester		Second Semester	
Elements of Gen. Agr. (123)	3.	Elements of Gen. Agr. (124)	3.
Elementary Chemistry (105) or General Chemistry (109)	4.	General Botany (102)	4.
Farm Accts. and Records (101)	2.	Mechanical Drawing (126)	2.
English (101)	2.	English (104)	2.
Element. French, German, or Spanish	4.	Element. French, German, or Spanish	4.
Military and Gymnasium		Military and Gymnasium	
	15.		15.

SECOND YEAR

Economics (135)	3.	Economics (136)	3.
Psychology (101)	3.	Psychology (102)	3.
Zoology (101)	3.	Zoology (102)	3.
General Botany (101)	4.	Agr. Chemistry (102)	4.
Forestry (101)	2.	Landscape Gardening (108) or Floriculture (119)	3.
Military		Military	
	15.		16.

THIRD YEAR

History of Education (101)	3.	History of Education (102)	3.
Horticulture (101)	4.	Horticulture (102)	4.
Dairying (101)	4.	Farm Equipment (Agr. 103)	4.
Types and Breeds of Live Stock, Animal Husbandry (129)	4.	Types and Breeds of Live Stock, Animal Husbandry (130)	4.
	15.		15.

FOURTH YEAR

Rural Life and Institutions (125) or History of Agr. Ed. (127)	2.	Teaching High School Agr. (122)	2.
Principles of Education (101)	3.	Principles of Education (102)	3.
Economic Entomology (107)	3.	Economic Entomology (108)	3.
General Geology (165)	3.	Elementary Soils (Agr. 104)	4.
Field Crop Production (106)	4.	Approved Electives	3.
	15.		15.

APPOINTMENT COMMITTEE

In order to serve the schools of the State, the Faculty has provided a committee, one of the duties of which is to assist graduates of the University to teaching positions for which they are best fitted. Any student of the University intending to teach is invited to enroll his name with the committee on a blank provided for that purpose. Blanks may be obtained from the Executive Office. Graduates of the University who are already engaged in teaching are also cordially invited to correspond with the Appointment Committee with a view to bettering their positions. Correspondence is invited from Boards of Education and from Superintendents and Principals of schools in need of teachers. No fee is charged for the services of the committee.

THE COLLEGE OF ENGINEERING

The purpose of the College of Engineering is to instruct students thoroughly in the fundamental sciences and arts upon which all engineering rests, and to impart such special and technical knowledge of the various branches of engineering as will enable students to enter them and maintain themselves while gaining their professional experience. In addition, it is believed that the severe mental discipline of the various courses of instruction makes the engineering curriculum fully the equal of any other in general educational value.

COURSES OF STUDY

OUTLINE OF THE FIRST YEAR'S WORK OF ALL FOUR-YEAR COURSES

In order to permit all engineering students to have a year in which to ascertain their tastes more fully and find out definitely what courses they desire to pursue, the first year of all engineering courses is made uniform. While students are asked to indicate their choice of courses on entering the college, they can change at the end of the first year without any inconvenience.

Note—The figure in parenthesis following the name of each study indicates the number of the study in its department; the other figure indicates the number of credit hours.

First Semester			Second Semester		
Mathematics College Algebra and Trig.	(131)	5.	Mathematics Trig. and Analytics.	(132)	5.
Chemistry General Chemistry.	(105 or 109)	4.	Chemistry General Chemistry and Qualitative Analysis.	(106 or 110)	4.
Modern Language French, Ger., or Span.		4.	Modern Language French, Ger., or Span.		4.
English Paragraph Writing.	(101)	2.	English Paragraph Writing.	(104)	2.
Engineering Drawing. Elementary Mechanical.	(101)	2.	Engineering Drawing Lettering and Projections.	(102)	3.
Military Drill		1.	Military Drill		1.
Gymnasium		1.	Gymnasium		1.

Students presenting Chemistry as an entrance subject will take Chemistry 109 and 110. Students with no entrance credits in chemistry will take Chemistry 105 and 106.

Summer Session—Students electing courses named below are required to take courses in the Summer Session as follows:

Ceramic Engineering—Two from Shopwork (107), (109) and (115), at the close of the first year.

Chemical Engineering—Shopwork (109) and (115) at the close of the first or second year.

Electrical Engineering, Mechanical Engineering and Mine Engineering—Shopwork (109) and (115) at the close of the first year.

COURSE IN ARCHITECTURE

FOR FIRST YEAR SEE PAGE 26

SECOND YEAR

First Semester			Second Semester		
Mathematics Calculus	(141)	5.	Mathematics Calculus.	(142)	5.
Engineering Drawing Charcoal from Ornament.	(115)	2.	Engineering Drawing Pen Drawing.	(116)	2.
Architecture History of Architecture.	(101)	3.	Architecture History of Architecture.	(102)	3.
Architecture Order Problems.	(103)	2.	Architecture Order Problems.	(104)	5.
Engineering Drawing Descriptive Geometry.	(107)	3.	Architecture Shades, Shadows and Perspective.	(124)	3.
Physics General Physics.	(111)	3.			
Military Drill		1.	Military Drill		1.

Summer Courses—Architecture (120), Architectural Practise, or an Architectural Problem.

THIRD YEAR

First Semester			Second Semester		
Mechanics Statics and Str. of Materials.	(101)	5.	Mechanics Strength of Materials.	(104)	2.
Engineering Drawing Water Color.	(117)	3.	Engineering Drawing Charcoal from Antique.	(118)	3.
Architecture Design.	(107)	5.	Architecture Design.	(108)	4.
Architecture Decoration, etc.	(109)	3.	Architecture Working Drawings.	(110)	4.
Architecture Arch. Composition.	(113)	2.	Architecture Photography.	(112)	2.
			Civil Engineering Trusses.	(124)	3.

Summer Courses—Architecture (121), Architectural Practise, or an Architectural Problem.

FOURTH YEAR

First Semester			Second Semester		
Architecture Design.	(115)	6.	Architecture Design.	(114)	3.
Architecture Plumbing.	(117)	1.	Architecture Professional Practice.	(116)	4.
Architecture Masonry.	(119)	2.	Civil Engineering Surveying.	(128)	2.
Civil Engineering Tall Buildings.	(125)	3.	Civil Engineering Cement and Concrete.	(118)	3.
Mechanical Eng. Materials of Const.	(123)	2.	Architecture Thesis.	(118)	5.
Mechanical Eng. Heating and Ventilating.	(121)	2.			
Engineering Drawing Clay Modeling.	(119)	2.			

COURSE IN CERAMIC ENGINEERING

FOR FIRST YEAR SEE PAGE 26

SECOND YEAR

First Semester			Second Semester		
Mathematics Calculus.	(141)	5.	Mathematics Calculus.	(142)	5.
Physics Mechanics and Heat.	(113)	5.	Physics Elec., Light and Sound.	(114)	5.
Engineering Drawing Descriptive Geometry.	(103)	3.	Engineering Drawing Machine Sketching.	(104)	3.
Ceramic Engineering Ceramic Chemistry.	(101)	5.	Ceramic Engineering Laboratory.	(102)	3.
			Ceramic Engineering Ceramic Calculations.	(106)	2.
Military Drill		1.	Military Drill		1.

THIRD YEAR

Mechanics Statics and Str. of Materials.	(101)	5.	Mechanics Strength of Materials.	(104)	2.
Chemistry Physical Chemistry.	(157)	3.	Chemistry Physical Chemistry.	(158)	3.
Mine Engineering Mine Surveying.	(103)	4.	Mechanical Eng. Mechanism and Design.	(110)	3.
Ceramic Engineering Ceramic Manufacture.	(103)	5.	Ceramic Engineering Ceramic Manufacture.	(104)	5.
Mine Engineering Mine Trip	(109)	1.	Ceramic Engineering Phys. Chem. Measurements.	(108)	3.
			Ceramic Engineering Glazes and Colors.	(110)	2.

FOURTH YEAR

Ceramic Engineering Laboratory.	(111)	5.	*Ceramic Engineering Laboratory.	(112)	5.
Ceramic Engineering Drawing.	(113)	2.	Ceramic Engineering Drawing.	(114)	3.
Mechanical Eng. Laboratory and Lecture.	(171)	4.	*Ceramic Engineering Cement Lectures.	(118)	5.
Civil Engineering Trusses.	(123)	3.	Civil Engineering Cement and Concrete.	(118)	3.
Metallurgy. Gen. Metallurgy.	(109)	4.	Geology General Geology.	(168)	3.
			Ceramic Engineering Thesis.	(116)	4.

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*Alternative Courses. One must be taken.

COURSE IN CHEMICAL ENGINEERING

FOR FIRST YEAR SEE PAGE 26

SECOND YEAR

First Semester			Second Semester		
Mathematics Calculus.	(141)	5.	Mathematics Calculus.	(142)	5.
Physics Gen. Physics.	(111)	3.	Physics Gen. Physics.	(112)	3.
Engineering Drawing Descriptive Geometry.	(103)	3.	Engineering Drawing Machine Sketching.	(104)	3.
Chemistry Quantitative Analysis.	(119)	4.	Chemistry Quantitative Analysis.	(120)	4.
Chemistry Adv. Gen. Chemistry.	(113)	2.	Chemistry Adv. Gen. Chemistry.	(114)	2.
			Chemistry Chemical Problems.	(124)	1.
Military Drill		1.	Military Drill		1.

THIRD YEAR

Mechanics Statics and Str. Matr'ls.	(101)	5.	Mechanics Kinetics and Hydraulics.	(102)	5.
Engineering Drawing Technical Drawing.	(121)	2.	Engineering Drawing Technical Drawing.	(122)	2.
Metallurgy Gen. Metallurgy.	(109)	4.	Metallurgy Mineralogy and Cryst'g'phy.	(104)	2.
Chemistry Organic Chem. lec.	(151)	2.	Chemistry Organic Chem., lec.	(152)	2.
Chemistry Organic Chem. lab.	(153)	2.	Electives (See foot note.)		6 to 8
Mechanical Eng. Steam Power Plants.	(103)	3.			

FOURTH YEAR

Mechanical Eng. Machine Design.	(127)	5.	Mechanical Eng. Machine Design.	(144)	5.
Chemistry Physical Chemistry.	(157)	3.	Chemistry Physical Chemistry.	(158)	3.
Chemistry Industrial Chemistry.	(177)	2.	Chemistry Industrial Chemistry.	(178)	1.
Chemistry Indust. Chem. lab.	(185)	2.	Chemistry Indust. Chem. lab.	(186)	3.
Electrical Eng. Elementary Elec. Eng.	(101)	5.	Chemistry Thesis.	(140)	4.
			Elective Chemistry (182 or 184)		2.

Electives in third year, second semester, must be chosen from the following courses, subject to approval of the departments concerned: Chemistry (136) 2, Chemical Literature; Chemistry (154) 2 or 3, Advanced Organic Chemistry; Chemistry (168) 3 to 5, Advanced Qualitative Analysis; Chemistry (176) 3, Sanitary Analysis; Chemistry (188) 2 or 3, Inorganic Preparations; Metallurgy (110) 4, General Metallurgy; Metallurgy (112) 2, Calorimetry and Mine Gas Analysis.

COURSE IN CIVIL ENGINEERING

FOR FIRST YEAR SEE PAGE 26

SECOND YEAR

First Semester			Second Semester		
Mathematics Calculus.	(141)	5.	Mathematics Calculus.	(142)	5.
Physics Gen. Physics.	(111)	3.	Physics Gen. Physics.	(112)	3.
Engineering Drawing Descriptive Geometry.	(105)	3.	Engineering Drawing Advanced Descriptive Geom.	(106)	3.
Civil Engineering Land Surveying.	(101)	4.	Civil Engineering R. R. Survey and Field Prac.	(102)	4.
Civil Engineering Field Prac. & Top. Drawing.	(103)	3.	Geology Gen. Geology.	(168)	3.
Military Drill		1.	Military Drill		1.

SUMMER COURSES—Civil Engineering (104 and 111), each four weeks of six days per week. Field work in Surveying. Required in second and third years respectively.

THIRD YEAR

Mechanics Statics and Str. of Mater'ls.	(101)	5.	Mechanics Kinetics and Hydraulics.	(102)	5.
Civil Engineering Topography Surveying.	(105)	3.	Civil Engineering Timber Construction.	(108)	3.
Civil Engineering Stereotomy.	(107)	3.	Civil Engineering Roads and Streets.	(106)	3.
Civil Engineering Sanitary Eng.	(109)	2.	Civil Engineering Stresses in Structures.	(110)	4.
Electrical Eng. Elementary Elec.	(103)	3.	Astronomy Geodesy and Least Squares.	(104)	3.
Architecture Photography.	(111)	2.			

FOURTH YEAR

Civil Engineering Bridge Design.	(113)	4.	*Civil Engineering Adv. Bridges.	(114)	4.
Civil Engineering Water Supply.	(117)	3.	*Civil Engineering Railways.	(112)	4.
Civil Engineering Masonry Construction.	(115)	3.	Civil Engineering Masonry Structures.	(116)	3.
Astronomy Geodesy and Least Squares.	(105)	3.	Civil Engineering Cement and Concrete.	(118)	3.
Mechanical Eng. Laboratory.	(173)	5.	Civil Engineering Contracts and Spec.	(120)	2.
Civil Engineering Thesis.	(119)	1.	Mechanical Eng. Mechanism and Mach. Des.	(140)	2.
			Civil Engineering Thesis.	(122)	4.

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*Alternative Courses. One must be taken.

COURSE IN ELECTRICAL ENGINEERING

FOR FIRST YEAR SEE PAGE 26

SECOND YEAR

First Semester			Second Semester		
Mathematics Calculus.	(141)	5.	Mathematics Calculus.	(142)	5.
Physics Mechanics and Heat.	(113)	5.	Physics Elec., Light and Sound.	(114)	5.
Engineering Drawing Descriptive Geometry.	(103)	3.	Physics Laboratory.	(134)	3.
Physics Laboratory.	(133)	2.	Engineering Drawing Machine Sketching.	(110)	2.
Shopwork Machine Work.	(119)	3.	Shopwork Adv. Machine Work.	(122)	3.
Military Drill		1.	Military Drill		1.

THIRD YEAR

Mechanics Statics and Str. of Materials.	(101)	5.	Mechanics Kinetics and Hydraulics.	(102)	5.
Physics Laboratory.	(135)	5.	Electrical Eng. D. C. Machinery.	(104)	5.
Mechanical Eng. Steam Power Plants.	(103)	3.	Mechanical Eng. Steam Engines.	(118)	3.
Mechanical Eng. Mechanism.	(101)	3.	Mechanical Eng. Laboratory.	(160)	2.
Engineering Drawing Technical.	(111)	2.	Electrical Eng. Applications A. C. Prin.	(106 & 108)	3.
			Electrical Engineering (130) or (134) Inspection Trip.		

FOURTH YEAR

Mechanical Eng. Laboratory.	(175)	3.	Electrical Eng. A. C. Laboratory.	(112)	3.
Electrical Eng. A. C. Laboratory.	(111)	3.	Electrical Eng. Transmission.	(124)	2.
Electrical Eng. A. C. Machinery.	(109)	3.	Industrial Arts Machine Design.	(112)	2.
Electrical Eng. Elec. Machine Design.	(121)	3.	Electrical Eng. Inspection Trip.	(130 or 134)	
Electrical Eng. Thesis.	(127)	1.	Electrical Eng. Thesis.	(128)	5.
Electrical Engineering.	(*)	2.			
Elective		2 to 4.	Elective		3 to 6.

*One of the following: (113) Railways, (115) Telephones, (117) Illumination, (119) Wireless Telegraphy.

Students who, for financial or other satisfactory reasons, are unable to take Electrical Engineering 130 may substitute Electrical Engineering 134 upon receiving permission from the head of the department.

COURSE IN MECHANICAL ENGINEERING

FOR FIRST YEAR SEE PAGE 26

SECOND YEAR

First Semester			Second Semester		
Mathematics Calculus	(141)	5.	Mathematics Calculus.	(142)	5.
Physics Mechanics and Heat.	(113)	5.	Physics General Physics.	(112)	3.
Engineering Drawing Descriptive Geometry.	(103)	3.	Engineering Drawing Machine Sketching.	(104)	3.
Shopwork (105) and (107) Foundry, Chipping, Filing.		3.	Shopwork Machine Work.	(120)	3.
Shopwork Adv. Pattern Making.	(111)	2.	Physics Laboratory.	(138)	2.
			Civil Engineering Surveying.	(128)	2.
Milltary Drill		1.	Military Drill		1.

THIRD YEAR

Mechanics Statics and Str. of Marter'ls.	(101)	5.	Mechanics Kinetics and Hydraulics.	(102)	5.
Engineering Drawing Technical Drawing.	(111)	2.	Architecture Photography.	(112)	2.
Metallurgy General Metallurgy.	(109)	4.	Civil Engineering Timber and Masonry.	(126)	2.
Mathematics Diff. Equations.	(151)	1.	Mech. Eng. Mechanism and Drawing.	(114 & 116)	3 & 1.
Shopwork Adv. Machine Work.	(121)	3.	Mech. Eng. Steam Engines and Boilers.	(118 & 120)	3 & 1.
Mechanical Eng. Steam Power Plants.	(103)	3.	Mechanical Eng. Laboratory.	(164)	2.
			Mechanical Eng. Inspection Trip.	(130 or 134.)	

FOURTH YEAR

Civil Engineering Trusses.	(123)	3.	*Industrial Arts Shop Building.	(114)	2.
Electrical Eng. Elementary Elec. Eng.	(101)	5.	*Mechanical Eng. Steam Turbines.	(146)	2.
Mechanical Eng. Machine Design.	(127)	5.	Mechanical Eng. Machine Design.	(144)	5.
Mechanical Eng. Gas Engines and Producers.	(125)	2.	Mechanical Eng. Hydraulic Machinery.	(142)	2.
Mechanical Eng. Thermodynamics.	(129)	2.	Mechanical Eng. Laboratory.	(190)	6.
Mechanical Eng. Laboratory.	(179)	2.	Mechanical Eng. Thesis.	(148)	3.
			Mechanical Eng. Inspection Trip.	(130 or 134)	

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*Alternative Courses. One must be taken.

Students who, for financial or other satisfactory reasons, are unable to take Mechanical Engineering (130) may substitute Mechanical Eng. (134) upon receiving permission from the head of the department.

COURSE IN MINE ENGINEERING

FOR FIRST YEAR SEE PAGE 26

SECOND YEAR

First Semester			**Second Semester**		
Mathematics Calculus.	(141)	5.	Mathematics Calculus.	(142)	5.
Physics General Physics.	(111)	3.	Physics General Physics.	(112)	3.
Engineering Drawing Descriptive Geometry.	(103)	3.	Engineering Drawing Machine Sketching.	(104)	3.
Chemistry. Quantitative Analysis.	(119)	3.	Metallurgy Laboratory.	(106)	4.
Mine Engineering. Mine Surveying.	(103)	4.	Metallurgy Mineralogy and Cyrst'l'g'phy	(104)	3.
			Mine Engineering Mine Trip.	(110)	1.
Military Drill		1.	Military Drill		1.

THIRD YEAR

Mechanics Statics and Str. of Mater'ls	(101)	5.	Mechanics Kinetics and Hydraulics.	(102)	5.
Metallurgy Gen. Metallurgy.	(109)	4.	Metallurgy Gen. Metallurgy.	(110)	4.
Metallurgy Fire Assaying.	(105)	3.	Metallurgy Calorimetry, Mine Gas Anal.	(112)	2.
Metallurgy Laboratory.	(107)	4.	Metallurgy Determinative Mineralogy.	(108)	3.
Geology Gen. Geology.	(165)	3.	Geology Petrography.	(166)	2.
			Civil Engineering Trusses.	(124)	3.

FOURTH YEAR

Mine Engineering Gen. Mining.	(105)	5.	Mine Engineering Gen. Mining.	(106)	5.
Metallurgy Metallurgical Const.	(111)	2.	Mine Engineering Plans and Specifications.	(104)	4.
Metallurgy Ore Dressing.	(113)	2.	Metallurgy Metallography, etc.	(114)	3.
Electrical Eng. Elementary Elec.	(103)	2.	Mechanical Eng. Laboratory.	(192)	3.
Geology Economic Geology.	(167)	3.	*Mine Engineering Thesis.	(116)	3.
Architecture Photography.	(111)	2.	*Metallurgy Thesis.	(116)	3.

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*Alternative Courses. One must be taken.

TWO YEAR COURSES

SHORT COURSE IN CLAYWORKING

FIRST YEAR

First Semester			Second Semester		
Mathematics Elementary Algebra.	(101)	5.	Mathematics Elementary Algebra.	(102)	5.
Mathematics Plain and Solid Geom.	(113)	5.	Mathematics Solid Geom. and Trig.	(114)	5.
Chemistry Elementary Chemistry.	(101)	4.	Chemistry Elementary Chemistry and Qualitative Analysis.	(102)	4.
Engineering Drawing Freehand and Lettering.	(113)	4.	Engineering Drawing Mechanical Drawing.	(114)	3.
Military Drill		1.	Military Drill		1.
Gymnasium		1.	Gymnasium		1.

*Summer Session—Students are required to take two of the following subjects: Shopwork (107) (109) and (115), during the Summer Session at the close of the first year.

SECOND YEAR

Ceramic Engineering Ceramic Chemistry.	(101)	5.	Ceramic Engineering Clay Manufacture.	(104)	5.
Ceramic Engineering Clay Manufacture.	(103)	5.	Ceramic Engineering Glazes and Colors.	(110)	2.
Ceramic Engineering Laboratory.	(115)	2.	Ceramic Engineering Laboratory.	(126)	5.
Physics Elementary Physics.	(101)	6.	Ceramic Engineering Ceramic Calculations.	(106)	2.
			Ceramic Engineering Lab. in Calculations.	(120)	1.
			Ceramic Engineering Dryer and Kiln Design.	(122)	2.
Military Drill		1.	Military Drill		1.

SHORT COURSE IN INDUSTRIAL ARTS

FIRST YEAR

First Semester			Second Semester		
Mathematics Elementary Algebra.	(101)	5.	Mathematics Elementary Algebra.	(102)	5.
Mathematics Plane and Solid Geom.	(113)	5.	Mathematics Solid Geom. and Trig.	(114)	5.
Engineering Drawing Freehand and Lettering.	(113)	4.	Engineering Drawing Mechanical Drawing.	(114)	3.
Shopwork Pattern Making.	(109)	2.	Shopwork Adv. Pattern Making.	(112)	2.
Shopwork Forging.	(115)	2.	Shopwork Foundry, Chipping, Filing.	(106 and 108)	3.
Military Drill		1.	Military Drill		1.
Gymnasium		1.	Gymnasium		1.

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*Upon presention of reasons satisfactory to the head of the department students may substitute work in a ceramic factory for the above shopwork courses.

SECOND YEAR

Engineering Drawing Descriptive Geometry.	(103)	3.	Engineering Drawing Machine Sketching.	(104)	3.
Industrial Arts Machines.	(101)	3.	Industrial Arts Machines.	(102)	3.
Industrial Arts Designing.	(103)	2.	Industrial Arts Designing.	(104)	2.
Physics Elementary Physics.	(101)	6.	Industrial Arts Strength of Materials.	(110)	6.
Shopwork Machine Work.	(119)	3.	Shopwork Adv. Machine Work.	(122)	3.
Military Drill		1.	Military Drill		1.

SHORT COURSE IN MINING

FIRST YEAR

First Semester			Second Semester		
Mathematics Elementary Algebra.	(101)	5.	Mathematics Elementary Algebra.	(102)	5.
Mathematics Plane and Solid Geom.	(113)	5.	Mathematics Solid Geom. and Trig.	(114)	5.
Physics Elementary Physics.	(101)	6.	Shopwork Forging.	(116)	2.
			Geology Elementary Physiography.	(162)	4.
Military Drill		1.	Military Drill		1.
Gymnasium		1.	Gymnasium		1.

SECOND YEAR

Engineering Drawing Freehand and Lettering.	(113)	4.	Engineering Drawing Mechanical Drawing.	(114)	3.
Chemistry Elementary Chemistry.	(101)	4.	Geology Elementary Geology.	(164)	3.
Mine Engineering Mine Plans.	(107)	2.	Metallurgy Water Supply and Mine Gases.	(102)	4.
Mine Engineering Mine Surveying.	(101)	5.	Mine Engineering General Mining.	(102)	5.
Military Drill		1.	Military Drill		1.

COLLEGE OF LAW

COURSES OF INSTRUCTION

FIRST YEAR

Elementary Law. Three hours a week, first semester. Assistant Professor Cockley.

Blackstone; Robinson's Elementary Law, and cases.

Sources of the law; organization of courts; study of cases; outline and general survey of the law.

Contracts. Three hours a week throughout the year. Professor Page.

Selected cases, references to assigned case-book, collateral references to assigned text-book and other collateral readings.

The nature of contract; the distinction between contract and other legal ideas; the history of contract; the formation, including offer and acceptance, consideration, subject-matter, and parties; the facts which render an offer and acceptance invalid, such as mistake, misrepresentation, fraud, duress and undue influence; formal contracts; written contracts; the statute of frauds; the operation, construction, interpretation and discharge of contracts; and the constitutional restrictions which are applicable to contracts, are considered in this course. It treats of the principles which are applicable to contracts in general, and is intended as a basis for the subsequent courses on the special types of contract; for the courses which consider the remedies given by common law and by equity; the damages awarded in such case of breach and the right of recovery in quasi contract on rescission or discharge.

Case-book and text-book will be announced later.

Torts. Two hours a week, first semester; three hours a week, second semester. Professor Tuttle.

Case-book and text.

Personal Property. Two hours a week, first semester. Professor Rightmire.

Schouler's Abridged Text on Personal Property, selected cases, and assigned readings.

The principal subjects classified under this head are treated in their relation to each other and the general field of Law. Attention is also given to judgement, execution, attachment, exemption and replevin.

Criminal Law and Procedure. Three hours a week, first semester. Professor TUTTLE.

Case-book and text.

Agency. Two hours a week, second semester. Assistant Professor COCKLEY.

Reinhard, Cases on Agency. Collateral reading in Mechem's Agency.

Real Property I. Two hours a week, second semester. Assistant Professor COCKLEY.

Text and cases. Distinctions between real and personal property, fixtures, rents, franchises, easements, profits, natural rights in land, licenses, and feudal tenures.

Domestic Relations. Two hours a week, second semester. Professor RIGHTMIRE.

Woodruff's Cases on Domestic Relations, other selected cases, and collateral reading.

Common Law Pleading and Procedure. Two hours, second semester. Professor KINKEAD.

An Historical consideration of Civil Procedure is essential to a proper understanding of the present system. This course will consist of an historical consideration of the common law and equity systems of pleading and procedure with special view to the blending of them into the Reformed System of Procedure under the Code. The work will consist of a study of Text Book, Cases, and collateral reading, amplified by lecture. Text Book, Kinkead's Common Law Pleading.

Debate and Oratory. One hour a week throughout the year. Assistant Professor BLANCHARD.

Fundamental principles; drill in voice and action; pronunciation, emphasis and articulation; analysis and study of choice selections from representative orators; original speeches.

SECOND YEAR

Real Property II. Three hours a week, first semester. Assistant Professor COCKLEY.

Text and cases. Estates; dower; curtesy; landlord and tenant; concurrent ownership; future interests; perpetuities.

Negotiable Instruments. Three hours a week, first semester. Professor RIGHTMIRE.

Smith and Moore—Cases on Bills and Notes, the Uniform Negotiable Instruments Law, and leading cases construing the same.

Evidence. Two hours a week, the year. Professor DILLON.

Text-book, Greenleaf, Sixteenth Edition by Wigmore.

Includes study of specially assigned excerpts from Wigmore, Thayer, and others, and leading cases. Special lectures on practical presentation of evidence in court room and upon the underlying principles of logical inference and probative value.

Code Pleading and Procedure. Three hours per week, first semester. Professor KINKEAD. Text-book, Phillips on Code Pleading.

Code Pleading as it prevails in all code states is taught by the use of text book, the code itself, and by illustrated cases, amplified by lectures touching the history and application of the system, illustrated by many concrete instances drawn from experience and observation. Special stress is laid upon a mastery of the Code Provisions themselves.

Damages. Two hours a week, second semester. Professor TUTTLE. Mechem's Cases.

Public Service Corporations, Carriers, and Bailments. Two hours a week, first semester. Professor RIGHTMIRE.

Cases and a study of State and Federal Legislation relating to Carriers.

Quasi Contracts. Two hours a week, first semester. Professor PAGE.

Text-book, Scott's Cases on Quasi Contracts; selected cases and collateral readings.

This course considers such obligations as are enforcible by contract remedies other than genuine contracts. It includes obligations of record; customary, official and statutory duties; and rights under the doctrine of unjust enrichment, such as payment by mistake, fraud, or compulsion; waiver of tort; and rights arising on rescission or discharge of genuine contract.

Real Property III. Three hours a week, second semester. Assistant Professor COCKLEY.

Text and cases.

Title to real property; mortgages.

Wills. Two hours a week, second semester. Professor PAGE.

Selected cases; references to assigned case book and text-book; other collateral readings.

This course deals with history of the law of wills; the nature of the will; the distinction between it and other legal ideas; the execution of the will; revocation, construction; the problems presented by devises and legacies; and the probate and contest of the will.

Partnership. Two hours a week, second semester. Professor TUTTLE.

Mechem's Cases.

Sales. Two hours a week, second semester. Professor RIGHTMIRE.

Text, cases, and study of uniform law of sales.

Suretyship. Two hours a week, second semester. Professor RIGHTMIRE.

Hennig, cases on Suretyship, other selected cases and collateral readings.

Debating. One hour a week throughout the year. Assistant Professor BLANCHARD.

Designed to develop readiness of extemporizations. Practical application of the principles of argumentation. Leading questions of the day debated in class. Preparation and discussion of briefs.

THIRD YEAR

Required Work

Constitutional Law. Three hours a week, first semester. Professor TUTTLE.

Case-book and text.

Private Corporations. Two hours a week throughout the year. Professor PAGE.

Wilgus's Annotated Cases on Private Corporations; selected cases and collateral readings.

A discussion of the nature of the private corporation; the distinction between it and other legal institutions; de facto corporations and corporations by estoppel; its creation and organization; stock subscriptions and stockholders; the powers, duties and liabilities of the corporation and of its members, officers and agents, including liability for contracts, torts and crimes; the nature and effect of *ultra vires* transactions; the control and regulation by the state, including the control of foreign corporations; the rights and liabilities growing out of the relations of corporation stockholders, officers, promoters and creditors with one another; consolidation and dissolution.

Equity Jurisprudence. Four hours a week, first semester. Professor SHAUCK.

Merwin, The Principles of Equity and Equity Pleadings.

The course consists of the study of a text book, lectures, quizzes, thesis, and the study of a large number of illustrative cases with an introduction to develop the relation of the systems of law and equity.

Practise and Practise Court. Two hours a week throughout the year. Professor ADAMS.

All features of trial work and the general work in the courts are treated in this course.

Public Corporations. Three hours a week, second semester. Professor ADAMS.

Text book and cases.

Legal Ethics. Five lectures, second semester. Professor ADAMS.

ELECTIVE WORK

In addition to the required courses, third year students must elect from the following such courses, as will, with their required work, aggregate thirteen to fourteen hours:

Bankruptcy. One hour a week, first semester. Professor ADAMS.
Text book and cases.

Conflict of Laws. Two hours a week, first semester. Professor TUTTLE.

Text book and cases.

Judgments and Auxiliary Legal Remedies. Two hours a week, first semester. Professor ADAMS.

Text book and cases.

Conveyancing. Two hours a week, first semester. Assistant Professor COCKLEY.

Text, cases, practise work in drafting more import forms of conveyances.

Insurance. Two hours a week, second semester. Assistant Professor COCKLEY.

Cases and collateral reading.

Brief-Making. Two hours a week, second semester. Professor ADAMS.

Text book and practical work. The purpose of this course is to train the student in finding the law, the use of cases and statutes, and the preparation of briefs on assigned statements of fact.

Trusts. Two hours a week, second semester. Professor ADAMS
Text book and cases.

Ohio Circuit and Supreme Court Practise. One hour a week, second semester. Professor SHAUCK.

Consists wholly of lectures and quizzes upon: (1) The substantive law and the practise with respect to the subjects of original jurisdiction in those courts; habeas corpus, quo warranto, and mandamus; (2) The causes which may be appealed from the court of common pleas to the circuit court for a trial *de novo*, and the mode of taking and challenging the appeal; (3) Proceedings in error and the manner of bringing questions into the record to be reviewed.

Federal Jurisdiction and Equity Pleading. Two hours a week, second semester. Professor RIGHTMIRE.

Lectures, selected cases, and collateral reading with special reference to Hughes on Federal Procedure.

Equitable Remedies. Two hours a week, second semester. Professor PAGE.

Ames's Cases in Equity Jurisdiction. Volumes I and II; selected cases and collateral readings.

A detailed study of equitable remedies, including specific performance; injunction; rescission and cancellations for fraud, mistake, duress and undue influence; and receiverships. This course considers the facts which give rise to the right to the various kinds of relief; the application of the doctrines involved therein and the limitations thereon; and the method of obtaining each kind of relief in proper cases.

THE ARTS-LAW COURSE

This course is fully described in the section of this bulletin devoted to the College of Arts, Philosophy and Science.

COLLEGE OF PHARMACY

COURSES

Two courses of study are offered in this college, viz.: The Short Course, extending over a period of two collegiate years; and the Long Course, extending over a period of four collegiate years and leading to a degree. The object of the Short Course is to train students for the general work of the dispensing pharmacist. It fully meets the requirements of the State Board of Pharmacy, and students completing it find no difficulty in securing registration. The Long Course, on the other hand, furnishes more extensive and more thorough training, which enables the graduate to follow successfully any line of chemical or pharmaceutical work.

THE SHORT COURSE

On the satisfactory completion of this course the student is granted a certificate of Pharmaceutical Chemist.

NOTE: The figures in parenthesis following the name of each study indicates the number of the study in its department; the other figure indicates the number of credit hours.

FIRST YEAR

First Semester			Second Semester		
Chemistry	(101)	4.	Chemistry	(102)	4.
Latin	(117)	4.	Latin	(118)	4.
Pharmacy	(101)	5.	Pharmacy	(102)	5.
Pharmacy	(109)	3.	Pharmacy	(110)	3.
Pharmacy	(113)	1.	Botany	(112)	4.
Drill		1.	Drill		1.
Gymnasium		1.	Gymnasium		1.

SECOND YEAR

Pharmacy	(103)	5.	Pharmacy	(104)	6.
Pharmacy	(105)	3.	Pharmacy	(106)	3.
Chemistry	(127)	5.	Pharmacy	(114)	3.
Chemistry	(121)	4.	Pharmacy	(116)	2.
Physiology	(107)	3.	Bacteriology	(102)	2.
Drill		1.	Drill		1.

THE COURSE LEADING TO A DEGREE

DEGREE—Bachelor of Science in Pharmacy.

NOTE: The figure in parenthesis following the name of each study indicates the number of the study in its department; the other figure indicates the number of credit hours for the subject.

FIRST YEAR

First Semester			Second Semester		
Chemistry	(105 or 109)	4.	Chemistry	(106 or 110)	4.
German	(101)	4.	German	(102)	4.
Mathematics	(121)	3.	Mathematics	(122)	3.
English	(101)	2.	English	(104)	2.
Botany	(101)	4.	Botany	(102)	4.
Drill		1.	Drill		1.
Gymnasium		1.	Gymnasium		1.

SECOND YEAR

Chemistry	(119)	4.	Chemistry	(120)	4.
Pharmacy	(101)	5.	Pharmacy	(102)	5.
Physics	(105)	4.	Physics	(106)	4.
Chemistry	(113)	2.	Chemistry	(114)	2.
German	(103)	4.	Chemistry	(124)	1.
Drawing	(129)	1.	Drawing	(130)	2.
Drill		1.	Drill		1.

THIRD YEAR

Pharmacy	(103)	5.	Pharmacy	(104)	6.
Pharmacy	(105)	3.	Pharmacy	(106)	3.
Physiology	(101)	3.	Physiology	(102)	3.
Chemistry	(151)	2.	Chemistry	(152)	2.
Chemistry	(153)	2.	Chemistry	(154)	2.
Bacteriology	(107)	3.	Bacteriology	(108)	3.

FOURTH YEAR

Geology	(165)	3.	Pharmacy	(108)	5.
Pharmacy	(107)	5.	Pharmacy	(112)	3.
Pharmacy	(111)	3.	Pharmacy	(114)	3.
Thesis			Pharmacy	(116)	2.
Elective (3 to 5 hours credit)			Metallurgy	(104)	2.
			Thesis		

COLLEGE OF VETERINARY MEDICINE

COURSE OF STUDY

FIRST YEAR

First Semester		Second Semester	
Vet. Med. (101) Anatomy.	6.	Vet. Med. (102) Anatomy.	10.
Chemistry (101) Principles.	4.	Chemistry (104) Qualitative Analysis.	2.
Physiology (105) Histology.	5.	Physiology (114) Veterinary Physiology.	3.
		Physiology (106) Chemical Physiology	5.
		Zoology (128) Embryology	2.
Cadet Service	1.	Cadet Service	1.
Gymnasium	1.	Gymnasium	1.

SECOND YEAR

First Semester		Second Semester	
Vet. Med. (105) Gen. Pathology	5.	Vet. Med. (120) Surgery.	5.
Vet. Med. (107) Materia Medica.	5.	Vet. Med. (126) Medicine.	5.
Bacteriology (101) Principles.	4.	Vet. Med. (108) Materia Medica.	3.
Vet. Med. (103) Anatomy.	8.	Vet. Med. (110) Pharmacy.	2.
		Vet. Med. (112) Pathology Lab.	3.
		Vet. Med. (114) Parasitology.	1.
		Vet. Med. (124) Clinic, Large Animals.	1½.
		Vet. Med. (118) Clinic, Small Animals.	1½.
Cadet Service	1.	Cadet Service	1.

THIRD YEAR

First Semester		Second Semester	
Vet. Med. (109) Horeshoeing.	3.	Vet. Met. (120) Surgery.	5.
Vet. Med. (111) Obstetrics.	3.	Vet. Med. (126) Medicine.	5.
Vet. Med. (127) Physical Diagnosis.	3.	Vet. Med. (122) Meat Inspection.	2.
Vet. Med. (115) Canine Diseases.	2.	Vet. Med. (128) Gen. Therapeutics.	2.
Vet. Med. (113) Pathology Lab.	3.	Vet. Med. (130) Ophthalmology.	1.
Vet. Med. (123) Clinic, Large Animals.	1½.	Vet. Med. (116) Canine Diseases.	2.
Vet. Med. (119) Clinic, Small Animals.	1½	Vet. Med. (124) Clinic, Large Animals.	1½
*Vet. Med. (125) Operating.	1.	Vet. Med. (118) Clinic, Small Animals.	1½.
*Vet. Med. (121) Operating.	1.	*An. Husbandry (116)	3.
*Bacteriology (117) Serum Therapy,	3-5.	*Bacteriology (118) Serum Therapy.	3-5.
*Bacteriology (119) Path. Protozoa.	3-5.	*Bacteriology (120) Path. Protozoa.	3-5.
		*Bacteriology (106) Path. Bacteria.	3.

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*Electives.

NOTE—At least two hours must be selected from the list of elective subjects, and credit must be obtained for any elective subject taken.

DEPARTMENTS OF INSTRUCTION

AGRICULTURAL CHEMISTRY

(Townshend Hall)

PROFESSORS VIVIAN AND WEBER, ASSOCIATE PROFESSOR LYMAN, ASSISTANT PROFESSOR BEAR, MR. RUTH, MISS SMITH AND ASSISTANTS

102. Application of Chemistry to Agriculture. Four credit hours. Second semester. Short courses in Agriculture and Horticulture.

103-104. General Agricultural Chemistry. Five credit hours. The year. Four-year courses in Agriculture, Horticulture, and Forestry. Prerequisite, Chemistry 106 or 110.

105-106. Advanced Agricultural Analysis. Five credit hours. The year. Prerequisite, 103-104.

107-108. Dairy Chemistry. Three to five credit hours. The year. Prerequisite, 103-104.

109-110. Chemistry of Soils. Three to five credit hours. The year. For students specializing in Agronomy. Prerequisite, 103-104.

111-112. Chemistry of Animal Nutrition. Three to five credit hours. The year. Prerequisite, 103-104 or equivalent.

121-122. Food Inspection and Analysis. Three to five credit hours. The year. Prerequisite, 103-104, or an equivalent preparation in quantitative analysis.

123-124. Domestic Science Chemistry. Five credit hours. Course in Domestic Science. The year. Prerequisite, Chemistry 106.

125-126. Advanced Household Chemistry. Three to five credit hours. The year. Prerequisite, 123-124.

GRADUATE WORK

131-132. Research Work. Five to ten credit hours. The year.

(Courses 105 to 112, 121-122 and 125-126 may be taken as graduate work if not previously elected, or continued as special lines of research during a graduate course.

AGRONOMY

(Townshend Hall)

PROFESSOR MCCALL, ASSISTANT PROFESSORS RAMSOWER AND LIVINGSTON, MR. DARST, MR. GRANT.

101. **Farm Equipment.** Four credit hours. Second semester. Prerequisite, Engineering Drawing 125.

102. **Agricultural Engineering.** Three credit hours. Second semester. Prerequisite, Agronomy 101.

103. **Farm Equipment.** Four credit hours. First semester. Two year courses in Agriculture and Horticulture.

104. **Elementary Soils.** Four credit hours. Second semester. Prerequisite, Geology 153 or 165. Four-year courses in Agriculture, Horticulture, and Forestry.

105. **Elementary Soils.** Four credit hours. First semester. Two-year courses in Agriculture and Horticulture.

106. **Field Crop Production.** Four credit hours. First semester. Prerequisite, Botany 101 or its equivalent.

107. **Advanced Soils.** Four credit hours. First semester. Prerequisite, Agronomy 104 or 105.

108. **Crop Production.** Four credit hours. Second semester. Two-year course in Agriculture.

109. **Seed and Market Grain.** Two credit hours. First semester. Prerequisite, Agronomy 106.

110. **Agricultural Experimentation.** Three credit hours. Second semester. Lecture arranged.

111. **Grasses and Forage Crops.** Three credit hours. First semester. Prerequisite, Botany 101 or its equivalent.

113. **Field Crop Improvement.** Three credit hours. First semester. Prerequisite, Agronomy 106.

*114. **Advanced Farm Machinery.** Two credit hours. Second semester. Prerequisite, Agronomy 101.

115-116. **Advanced Crop Production.** Five to ten credit hours. The year.

117-118. **Advanced Crop Improvement.** Five to ten credit hours. The year.

119-120. **Research Work in Soils.** Five to ten credit hours. The year.

121. **Farm Architecture.** Two credit hours. First semester. Prerequisite, Drawing 125.

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*Not given in 1912-1913.

AMERICAN HISTORY

(Office Room 207, University Hall)

PROFESSOR KNIGHT, ASSOCIATE PROFESSOR HOCKETT

101-102. Political History of the United States. Three credit hours. The year.

102 b. Political History of the United States. Three credit hours. Second semester. Repetition of first semester of Course 101-102.

103-104. The American Colonies, 1600-1763. Two credit hours. The year.

105-106. The Revolutionary and Critical Period, 1763-1787. Two credit hours. The year.

107-108. Constitutional History of the United States. Two credit hours. The year.

***109-110. Political Parties in the United States.** Two credit hours. The year. Given biennially.

111. The Slavery Struggle to 1854. Three credit hours. First semester. Given biennially, alternating with Course 113.

112. The Slavery Struggle and its Results, 1854-1900. Three credit hours. Second semester. Given biennially, alternating with Course 114.

***113. The History of American Diplomacy, 1776-1850.** Three credit hours. First semester. Given biennially, alternating with Course 111.

***114. American Diplomatic History and Problems, 1850-1910.** Three credit hours. Second semester. Given biennially, alternating with Course 112.

***115-116. The History of the West.** Three credit hours. The year.

119-120. Seminar in Political History. Two credit hours. The year. Prequisite, four semesters in American history.

121. The Teaching of American History. Two credit hours. First semester.

GRADUATE WORK

***201. Reconstruction of the South, 1862-1870.** Two credit hours. First semester.

***202. Political History of the South, 1870-1900.** Two credit hours. Second semester.

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*Not given in 1912-1913.

203-204. The United States and Latin America, 1800-1905. Two credit hours. The year.

205. Graduate Seminar in American History. Two credit hours. First semester.

206. Graduate Seminar in American History. Two credit hours. Second semester.

ANATOMY AND PHYSIOLOGY

(Office, Room 12, Biological Hall)

PROFESSOR BLEILE, ASSOCIATE PROFESSOR SEYMOUR,

ASSISTANT PROFESSOR DURRANT.

101-102. Human Anatomy and Physiology. Three credit hours. The year. Must be preceded or accompanied by a course in chemistry.

103. General Physiology. Three credit hours. First semester. Short course in Agriculture.

104. Chemical Physiology. Three credit hours. Second semester.

105-106. Histology and Histo-Chemistry. Five credit hours. The year.

107. Human Anatomy, Physiology. Three credit hours. First semester.

109-110. Physiology Laboratory. Three credit hours. The year.

111-112. Physiological Laboratory. Five credit hours. The year.

114. Comparative Physiology. Three credit hours. Second semester.

115. Advanced Physiology. Three credit hours. First semester. Prerequisite, Physiology 101-102.

118. Advanced Physiology. Three credit hours. Second semester.

119-120. General Physiology. Three credit hours. The year. Arranged for students who have no credit in chemistry.

GRADUATE WORK

201-202. Advanced Physiology. Three credit hours. The year.

203-204. Advanced Physiology. Five credit hours. The year.

ANIMAL HUSBANDRY

(Live Stock Pavilion)

PROFESSORS PLUMB, AND MARSHALL, ASSISTANT PROFESSOR VAUGHAN, MR. JACOBY.

101. **Types and Classes of Cattle and Sheep.** Four credit hours. First semester.

102. **Types and Classes of Horses and Swine.** Four credit hours. Second semester.

103. **Breeds of Horses and Sheep.** Four credit hours. First semester.

104. **Breeds of Cattle and Swine.** Four credit hours. Second semester.

105. **Feeding Animals.** Four credit hours. First semester.

106. **Principles of Breeding.** Four credit hours. Second semester.

107. **Animal Conformation and Stock Judging.** Four credit hours. First semester.

108. **Live Stock Management.** Four credit hours. Second semester. This course should be preceded by Courses 105 and 106.

109. **Horse Training, Harness and Vehicle.** Two credit hours. First semester.

110. **Meats and Meat Products.** One credit hour. Second semester.

112. **Live Stock Marketing and Commerce.** Three credit hours. Second semester.

114. **Biographical Studies of Master Breeders.** One credit hour. Second semester.

116. **Dairy Cattle.** Four credit hours. Second semester.

117-118. **Poultry Husbandry.** Three credit hours. The year.

120. **Poultry Feeding.** One credit hour. Second semester.

122. **Incubator Practise.** One credit hour. Second semester.

123. **Dairy Cattle.** Four credit hours. First semester.

125. **Feeding Animals.** Three credit hours. First semester.

126. **Wools and Other Animal Fibers.** Three credit hours. Second semester.

128. **Feeding and Breeding of Animals.** Three credit hours. Second semester.

129-130. **Types and Breeds of Live Stock.** Four credit hours. The year.

132. **Types and Breeds of Live Stock.** Three credit hours. Second semester. Third year. Elective.

GRADUATE WORK

201-202. **Research Work.** Ten or more hours of graduate work may be arranged in various lines of study.

ARCHITECTURE

(Office, Room 22, Brown Hall)

PROFESSOR BRADFORD, ASSOCIATE PROFESSOR CHUBB, MR. HASKETT

101. **History of Architecture.** Three credit hours. Architecture second year, first semester.

102. Continuation of 101. Architecture, second year, second semester.

103. **Order Problems.** Two credit hours. Architecture, second year, first semester. Prerequisite, Engineering Drawing 102. Concurrent with Engineering Drawing 107.

104. **Order Problems.** Five credit hours. Architecture, second year, second semester. Prerequisite, Course 103.

107. **Design.** Five credit hours. Lectures and practise. Architecture, third year, first semester. Prerequisite, Course 104. Concurrent with Course 113.

108. **Design.** Four credit hours. Architecture, third year, second semester. Prerequisite, Course 107.

109. **Decoration and Ornament.** Three credit hours. Architecture, third year, first semester. Prerequisite, Course 104, and Engineering Drawing 115.

110. **Working Drawings.** Four credit hours. Architecture, third year, second semester. Prerequisite, Course 107.

111. **Photography.** Two credit hours. Civil Engineering, third year, first semester; Mine Engineering, fourth year, first semester. Prerequisite, Chemistry 105, 106, or 109, 110.

112. **Photography.** Two credit hours. Mechanical Engineering, Architecture, third year, second semester. Prerequisite, Chemistry, 105, 106, or 109, 110.

113. **Principles of Architectural Composition.** Two credit hours. Architecture, third year, first semester. Concurrent, Architecture 109.

114. **Designing.** Three credit hours. Architecture, fourth year, second semester. Prerequisite, Course 108.

115. **Designing.** Six credit hours. Architecture, fourth year, first semester. Prerequisite, Course 108.

116. **Professional Practise.** Four credit hours. Architecture, fourth year, second semester. Prerequisite, Course 115.

117. **Sanitary Plumbing.** One credit hour. Architecture, fourth year, first semester.

118. **Thesis.** Five credit hours. Architecture, fourth year, second semester.

119. **Masonry.** Two credit hours. Architecture, fourth year, first semester. Prerequisite, Course 110.

120. **Summer Work.** The equivalent of four weeks of work in an architect's office, or working up a problem in design assigned by the department. Between the second and third years.

121. **Summer Work.** The equivalent of four weeks' work in an architect's office, or a problem in design, assigned by the department. Between the third and fourth years.

122. **Photography.** Two credit hours. Second semester, Prerequisite, Course 111 or 112.

124. **Shades, Shadows and Perspective** Three credit hours. Architecture, second year, second semester. Prerequisite, Engineering Drawing 107.

125-126. **Advanced Photography.** Two credit hours. The year.

GRADUATE WORK

201-202. **Advanced Design.** Three to ten credit hours. The year.

203-204. **Research Work.** Three credit hours. The year.

ANCIENT ART

(See Greek Language and Literature)

ART

(Office, Hayes Hall)

PROFESSOR LAVER, MISS FINNEY, MISS ROBINSON

101-102. **Design and Composition.** Two credit hours. The year.

This course is designed to develop appreciation of harmony of line, space, and color.

Medium: pencil, ink, charcoal, and water color.

103-104. **Still Life Composition.** One or more credit hours. The year. Lecture and studio work.

This course offers training in form and the study of neutral values and light and shade as related to color.

105-106. **Design and Composition.** Two credit hours. The year. Prerequisite, Art 101-102.

Advanced problems in color and line as applied to decoration.

107-108. **Still Life Composition in Color Values.** One or more credit hours. The year. Prerequisite, Art 103-104. Lecture and studio work.

Cast drawing. Medium: charcoal. Outdoor sketching and study from life.

109-110. **Design and Composition.** Three credit hours. The year Prerequisite, Art 105-106.

This course consists of discussions of methods and experiments with material and application in leather, copper, brass, clay, silver, etc.

111-112. **Study from Head and Costumed Model.** One or more credit hours. The year. Prerequisite Course 107-108. Lectures and studio work.

Medium: selected. Outdoor sketching in color.

113-114. **Design and Composition.** Three credit hours. The year. Prerequisite, Art 109-110.

The study of historic ornament, and of noted compositions, for their color and beauty of line. Pictorial applications.

115-116. **Advanced Courses in Painting from Still Life and Model; Outdoor Sketching.** One or more credit hours. The year. Prerequisite, Art 111-112. Time and requirements same as Art 111-112.

117-118. **The Teaching of Art.** Three credit hours. The year. Prerequisite, Art 109-110 and 111-112.

Theory, Psychology, and Pedagogy of Art; Practical work; students teach under criticism after observation of expert teaching.

119-120. **Art Appreciation.** One credit hour. The year. Required of students taking Art 113-114, 115-116, 117-118.

Special phases in the evolution of art considered. Open to all students and teachers.

NOTE—Two studio hours are the equivalent of one credit hour. In the studio courses, 103-104, 107-108, 111-112, 115-116, students are required to attend one lecture each week.

ASTRONOMY

(Office, Emerson McMillin Observatory)

PROFESSOR LORD, ASSOCIATE PROFESSOR MANSON

101-102. **General Astronomy.** Three credit hours. The year. For undergraduates.

104-105. Astronomy Geodesy and Least Squares. Three credit hours. The year.

This course begins in the second semester and continues through the first semester of the following year. Prerequisite, the calculus.

107-108. Advanced Astronomy. Three to five credit hours. The year. Prerequisite, the calculus.

109-110. The Theory of Lenses. Four credit hours. The year. Prerequisite, the calculus.

BACTERIOLOGY

(Office, Veterinary Laboratory Building)

PROFESSORS MORREY AND MCCAMPBELL, MR. STARIN

These courses in Bacteriology are open to advanced undergraduates and graduate students only. The instructor in charge must be consulted before electing.

101. Bacteriology. Four credit hours. First semester. Second year in Veterinary Medicine.

102. Bacteriology. Two credit hours. Second semester. For Pharmacy Students.

104. Agricultural Bacteriology. Three credit hours. Second semester. For two year courses in Agriculture and Horticulture.

106. Bacteriology. Three credit hours. Second semester, third year. A review of the bacteria pathogenic to animals.

107. General Bacteriology. Three to five credit hours. First semester.

108. Pathogenic Bacteria. Three to five credit hours. Second semester. Prerequisite, Course 107.

110. Dairy Bacteriology. Three to five credit hours. Second semester. Prerequisite, Course 107.

112. Soil Bacteriology. Three to five credit hours. Second semester. Prerequisite, Course 107.

114. Water Examination, Sewage Disposal, Water Filtration. Three to five credit hours. Second semester. Prerequisite, Course 107.

116. Bacteriological Chemistry (Enzymes). Three to five credit hours. Second semester. One lecture, one quiz, two to six hours laboratory work. Prerequisite, Course 107.

121-122. Advanced Dairy Bacteriology. Three to five credit hours. The year. Prerequisites, Courses 107 and 110, or equivalents.

123-124. Advanced Soil Bacteriology. Three to five credit hours. The year. Prerequisites, Courses 107 and 112, or equivalents.

GRADUATE WORK

117-118. Immunity and Serum Theraphy. Three to five credit hours. The year. Lectures and laboratory. Prerequisites, Courses 107 and 108, or equivalents.

119-120. Pathogenic Protozoa. Three to five credit hours. The year. Two lectures, two to six hours laboratory work. Prerequisite, Courses 107 and 108, or equivalents.

125-126. Special Problems in Bacteriology. Three to five credit hours. The year. Conferences, library, and laboratory work. Prerequisite, one year's work in Bacteriology.

BIBLIOGRAPHY

(Office, Orton Hall)

MISS JONES AND MEMBERS OF THF LIBRARY STAFF

101-102. The Library and the School. One credit hour. The year.

103. Agricultural Bibliography. One-half credit hour. First semester. A required course for students in the College of Agriculture.

105-106. Bibliography for the Social Sciences. One credit hour. The year.

BOTANY

(Office, Botanical Hall)

PROFESSOR SCHAFFNER, ASSISTANT PROFESSORS GRIGGS AND DACHNOWSKI, MISS DETMERS

101-102. General Botany. Four credit hours. The year. Text-books, Curtis's Nature and Development of Plants, Schaffner's Laboratory Outlines for General Botany (2d edition).

110. Dendrology. Two credit hours. Second semester. Textbook, Schaffner's Trees of Ohio and Surrounding Territory.

112. Elementary Botany. Four credit hours. Second semester. Text-books: Bergen and Caldwell's Practical Botany, and Kellerman's Spring Flora (new edition). This course cannot be used for university credit.

116. Plant Pathology. Three credit hours. Second semester. Text-book, Druggar's Fungous Disease of Plants.

117-118. **Forest Botany.** Four credit hours. The year. Prerequisite, Botany 101-102, or equivalent.

120. **Field Botany.** Two credit hours. Second semester, Prerequisite, General Botany.

121. **Plant Genetics.** Two credit hours. First semester. One lecture, one laboratory period. Prerequisite, Botany 101-102 and one additional year of some biological subject. Students electing this course should also take Zoology 129.

123-124. **Advanced Morphology.** Three to five credit hours. The year. Prerequisite, Botany 101-102, or equivalent.

125-126. **Plant Physiology.** Four credit hours. The year. Prerequisite, Botany 101-102, or equivalent.

127-128. **Special Mycology.** Three credit hours. The year. Laboratory and field work. Prerequisite Botany 101-102, or equivalent.

129-130. **Systematic Botany.** Three to five credit hours. The year. Prerequisite, Botany 101-102, or equivalent.

131-132. **Cytology and Microtechnique.** Three to five credit hours. The year. Prerequisite, Botany 123-124, or equivalent.

133-134. **Minor Investigations.** Three to five credit hours. The year. Prerequisite, Botany 101-102, or equivalent.

135-136. **Evolution of Plants.** One credit hour. The year. Prerequisite, one-year course in botany.

137-138. **Seminar.** One credit hour. The year. Prerequisite one-year course in botany.

This course should be elected only in connection with other advanced work.

GRADUATE WORK

201-202. **Research in Systematic Botany.** Three to ten credit hours. The year. Laboratory open daily.

203-204. **Research in Morphology and Cytology.** Four to ten credit hours. The year. Laboratory open daily.

205-206. **Research in Physiology and Ecology.** Four to ten credit hours. The year. Laboratory open daily.

CERAMIC ENGINEERING

(Office, Room 131, Mines Building)

PROFESSOR ORTON, ASSISTANT PROFESSOR STALEY, MR. HARROP
MR. POTTS

101. **Ceramic Chemistry.** Five credit hours. Ceramic Engineering and Short Clay-working, second year, first semester. Prerequisite, Chemistry 106 or 110.

102. **Ceramic Chemistry.** Three credit hours. Ceramic Engineering, second year, second semester. Prerequisite, Course 101.

103. **Ceramic Manufacture.** Five credit hours. Ceramic Engineering, third year, first semester; Short Clay-working, second year, first semester.

104. Continuation of Course 103. Five credit hours. Ceramic Engineering, third year; Short Clay-working, second year, second semester.

106. **Ceramic Calculations.** Two credit hours. Ceramic Engineering and Short Clay-working, second year, second semester. Prerequisite, Course 101.

108. **Physical and Chemical Measurement of Plays.** Three credit hours. Ceramic Engineering, third year, second semester.

110. **Colors and Glazes.** Two credit hours. Ceramic Engineerng, third year, second semester; Short Clay-working, second year, second semester. Prerequisite, Courses 101 and 103.

111. **Laboratory Work in Ceramics.** Five credit hours. Ceramic Engineering, fourth year, first semester. Prerequisite, Courses 104, 108, 110.

112. Continuation of Course 111. Five credit hours. Ceramic Engineering, fourth year, second semester; Prerequisite, Course 111.

113. **Ceramic Designing.** Two credit hours. Ceramic Engineering, fourth year, first semester. Prerequisite, Course 104.

114. Continuation of Course 113. Three credit hours. Ceramic Engineering, fourth year, second semester. Prerequisite, Course 113.

115. **Laboratory Work in Ceramics.** Two credit hours. Short Clay-working, second year, first semester. Concurrent, Course 103.

116. **Thesis.** Four credit hours. Ceramic Engineering, fourth year, second semester.

118. **Cement Manufacture.** Five credit hours. Alternative with Course 112. Ceramic Engineering, fourth year, second semester. Prerequisite Courses 102 and 104.

120. **Laboratory Drill in Ceramic Calculations.** One credit hour. Short Clay-working, second year, second semester.

Dryer and Kiln Design. Two credit hours. Short Clay-working, second year, second semester. Concurrent with Course 106.

126. **Laboratory Work in Ceramics.** Five credit hours. Short Clay-working, second year, second semester. Prerequisite, Course 115.

GRADUATE WORK

201-202. **Research Work.** Three to ten credit hours. The year.

CHEMISTRY

(Office, Chemistry Hall)

PROFESSOR MCPHERSON, EMERITUS PROFESSOR NORTON, PROFESSORS HENDERSON, FOULK, EVANS, ASSOCIATE PROFESSOR WITHROW, DR. WILKINSON, DR. KELLOGG, AND DEPARTMENT ASSISTANTS

FOR UNDERGRADUATES

101. Elementary Chemistry. Four credit hours. First semester. One lecture, one quiz, six hours' laboratory work weekly.

102. Elementary Chemistry and Qualitative Analysis. Four credit hours. Second semester. One lecture, one quiz, six hours' laboratory work weekly. Prerequisite, Course 101.

104. Qualitative Analysis. Two credit hours. Second semester Six hours' laboratory work weekly.

105. Elementary Chemistry. Four credit hours. First semester.

106. Elementary Chemistry and Qualitative Analysis. Four credit hours. Second semester. Prerequisite, Course 105.

109. General Chemistry. Four credit hours. First semester. One lecture, one quiz, six hours laboratory work weekly.

110. General Chemistry and Qualitative Analysis. Four credit hours. Second semester. Prerequisite, Course 109.

113-114. Advanced General Chemistry. Two credit hours. The year. Prerequisite, Course 106 or 110.

117. Qualitative Analysis. Three credit hours. First semester. One lecture and six hours' laboratory work weekly. Prerequisite, an acceptable course in general chemistry.

119-120. Quantitative Analysis. Four credit hours. The year. One lecture, nine hours' laboratory work weekly. Laboratory open forenoons and afternoons. Prerequisite, Courses 105 or 110, or equivalent.

121. Quantitative Analysis. Four credit hours. First semester. One lecture, nine hours' laboratory work weekly. Laboratory open forenoons and afternoons. Prerequisite, Course 102.

124. Chemical Problems. One credit hour. Second semester.

127. Organic Chemistry. Five credit hours. First semester. Two lectures, one quiz, six hours' laboratory work weekly. Prerequisite, an acceptable course in general chemistry.

131-132. The Teaching of Chemistry. Two credit hours. The year. Two lectures or conferences weekly. Prerequisite, permission of the instructor. Given in 1913-1914 and biennially thereafter.

136. **The Reading of Chemical Literature.** Two credit hours. Second semester. Prerequisite, one year of German.

140. **Thesis.** Four credit hours. Chemical Engineering, fourth year, second semester,

151-152. **Organic Chemistry.** Two credit hours. The year. Prerequisite, Courses 113-114 and 119-120, except by special permission of the instructor.

153-154. **Organic Chemistry.** Two or three credit hours. The year. Six or nine hours' laboratory work weekly. Laboratory open afternoons. This course must be accompanied or preceded by Course 151-152.

157-158. **Physical Chemistry.** Three credit hours. The year. Prerequisite, Courses 113-114, 119-120, and 151-152, except by special permission of the instructor.

161. **Physical Chemistry.** Two or three credit hours. First semester. Six to nine hours' laboratory work weekly. Prerequisite Course 157-158.

162. **Physical Chemistry.** Two or three credit hours. Second semester. Repetition of Course 161.

165. **Quantitative Analysis.** Advanced Course. Three to five credit hours. First semester. Two lectures, three to nine hours' laboratory work weekly. Prerequisite, course 119-120, or equivalent.

167. **Special Methods of Analysis.** Three to five credit hours. First semester. Prerequisite, Course 119-120.

168. **Qualitative Analysis.** Advanced course. Second semester. Three to five credit hours. One lecture, six to twelve hours' laboratory work weekly. Prerequisite, Course 119-120, or equivalent.

176. **Sanitary Analysis.** Three credit hours. Second semester. Two lectures, three hours' laboratory work weekly. Laboratory open forenoons and afternoons. Prerequisite, Course 119-120, or equivalent.

177. **Industrial Chemistry.** Two credit hours. First semester. Prerequisite, Courses 113-114 and 153-154, or permission of instructor.

178. **Industrial Chemistry.** One credit hour. Second semester. A continuation of Course 177.

182. **Industrial Inspection Trip.** A four to six day excursion at a suitable,time in connection with Courses 177 and 178, for the inspection of industrial chemical processes in actual operation. The entire expense is about $30. A satisfactory report on the work inspected is required. The trips are under the immediate charge of Mr. WITHROW.

184. **Written Report.** A course of assigned reading upon some industrial chemical process and a written report on same. This course

is a substitute for Course 182, but the substitution is only allowed upon presentation of reasons satisfactory to the instructor in charge.

185. **Industrial Chemistry.** Two credit hours. One conference, five hours' laboratory work weekly. Prerequisite, Course 119-120. Prerequisite, or concurrent, Course 177. A course in industrial chemical research.

186. **Industrial Chemistry.** Three credit hours. One conference, eight hours' laboratory work weekly. Prerequisite, Course 119-120. Prerequisite, or Concurrent, Courses 177 and 178. A course of industrial chemical research and technical analysis.

187. **Inorganic Preparations.** Two or three credit hours. First semester. Six to nine hours' laboratory work weekly. Laboratory open afternoons. Prerequisite, Course 113-114.

188. **Inorganic Preparations.** Two or three credit hours. Second semester. Repetition of Course 187.

191. **Rare Elements.** Two credit hours. First semester Prerequisite, Courses 119-120 and 113-114. Given biennially.

194. **Applied Electro-Chemistry.** Two credit hours. Second semester. Prerequisite, Chemistry, 157-158, except by special permission of the instructor. Associate Professor WITHROW.

GRADUATE WORK

201-202. **Physical Chemistry.** Three credit hours. The year, or may be elected either semester separately. Nine hours' laboratory work weekly. Prerequisite, Course 157-158.

205-206. **Organic Chemistry.** Advanced Course. Three to five credit hours. The year. Library, conference, and laboratory work. Prerequisite, Course 153-154.

209-210. **Inorganic Preparations.** Three credit hours. The year. Library and laboratory work. Prerequisite, Course 187-188.

213. **Historical Chemistry.** Two credit hours. First semester. Prerequisite, permission of the instructor in charge. Given in 1910-1911 and biennially thereafter.

215. **Organic Chemistry.** Two credit hours. First semester. Two lectures weekly. Prerequisite, permission of instructor in charge. Given in 1912-1913 and biennially thereafter.

218. **Organic Chemistry.** Two credit hours. Second semester. Prerequisite, permission of the instructor in charge. Given 1911-1912 and biennially thereafter.

220. **Inorganic Chemistry.** Two credit hours. Second semester. Prerequisite, Chemistry 157-158. Given in 1911-1912 and biennially thereafter.

221. The Phase Rule. Two credit hours. First semester. Given in 1911-12 and biennially thereafter. Prerequisite, permission of the instructor in charge.

224. Electro Chemistry. Two credit hours. Second semester. Given in 1911-12 and biennially thereafter. Prerequisite, permission of the instructor in charge.

227. Analytical Chemistry. Two credit hours. First semester. Prerequisite, permission of the instructor in charge.

231-232. Chemical Seminar. One credit hour. The year. All those engaged in giving instruction in the department, together with the fellows and graduate students, meet for an extended discussion of chemical problems of general interest.

235-236 Research Work. Five to ten credit hours. The year. Library, conference, and laboratory work. Prerequisite, premission of the instructor in charge. Research work in organic chemistry is conducted under the supervision of Professor McPHERSON and Professor EVANS; in physical and general chemistry, under Professor HENDERSON; in analytical chemistry, under Professor FOULK and Dr. WILKINSON; in industrial and electro chemistry, under Associate Professor WITHROW.

CIVIL ENGINEERING

(Office, Room 33, Brown Hall)

PROFESSORS SHERMAN, ENO, AND MORRIS, ASSISTANT PEOFESSORS SCHLAFLY AND CHAMBERLIN, MR. WAID, MR. STERTZBACH, MR. WARD, MR. MCCALL.

101. Land Surveying. Four credit hours. Four recitations weekly. Civil Engineering, second year, first semester. Prerequisite, Mathematics 132, Engineering Drawing 102.

101 a. Field Practise. One credit hour. Three hours per week in field. Civil Engineering, second year, first semester.

102. Railroad Surveying. Three credit hours. Civil Engineering, second year, second semester. Prerequisite, Courses 101 and 101 a.

102. a Field Practise. One credit hour. Three hours per week in field. Civil Engineering, second year, second semester.

103. Topographic Drawing. Two credit hours. Six hours per week in drafting room. Civil Engineering, second year. First semester. Prerequisite, Engineering Drawing 102.

104. Summer Surveying Camp. Civil Engineering at close of second year. Prerequisite, Courses 101 a and 102 a.

105. **Topographic Surveying.** Three credit hours. Nine hours per week in field or drawing room. Civil Engineering, third year. first semester. Prerquisite, Courses 101, 102 and 104.

106. **Roads and Streets.** Three credit hours. Three recitations weekly. Civil Engineering, third year, second semester. Prerequisite, Courses 102 and 104.

107. **Stereotomy.** Three credit hours. Recitations, lectures, and drawing. Civil Engineering, third year, first semester. Prerequisite, Engineering Drawing 106.

108. **Timber Construction.** Three credit hours. Lectures and laboratory. Civil Engineering, third year, second semester. Prerequisite, Engineering Drawing 105, Concurrent, Mechanics 102.

109. **Sanitary Engineering.** Two credit hours. Two recitations per week. Civil Engineering, third year, first semester. Prerequisite, Courses 102 and 104.

110. **Stresses in Structures.** Four credit hours. Four hour recitations weekly. Civil Engineering, third year, second semester. Concurrent, Mechanics 102.

111. **Summer Surveying Camp.** Civil Engineering at close of third year. Prerequisite, Courses 104 and 105.

112. **Railway Location.** Four credit hours. Four recitations per week. Optional with Course 114. Civil Engineering, fourth year, second semester. Prerequisite Courses 102 and 111, and Mechanics 102.

113. **Bridge Designing.** Four credit hours. Four recitations per week. Civil Engineering, fourth year, first semester. Prerequisite, Course 110.

114. **Advanced Bridges.** Four credit hours. Four recitations per week. Optional with Course 112. Civil Engineering, fourth year, second semester. Prerequisite, Course 113.

115. **Masonry Construction.** Three credit hours. Three recitations weekly. Civil Engineering, fourth year, first semester. Prerequisite, Course 111, Mechanics 102.

116. **Masonry Structures.** Three credit hours. Three recitations, lectures, and drawing per week. Civil Engineering, fourth year, second semester. Prerequisite, Course 115.

117. **Water Supply.** Three credit hours. Three recitations per week Civil Engineering, fourth year, first semester. Prerequisite, Course 111, Mechanics 102.

117 a. Repetition of Course 117 in the second semester.

118. **Cement and Concrete.** Three credit hours. Architecture, Ceramic, and Civil Engineering, fourth year, second semester. Prerequisite, Mechanics 102, or 104.

118 a. Repetition of Course 118 in the second semester.

119. **Thesis.** One credit hour. Civil Engineering, fourth year, first semester. Prerequisite, Courses 110 and 111.

120. **Contracts and Specifications.** Two credit hours. Two recitations weekly. Civil Engineering, fourth year, second semester. Prerequisite, Courses 106, 109 and 115.

121. **Surveying and Topographic Drawing.** Six credit hours. First semester. Prerequisite, Mathematics 114 or 132, and Engineering Drawing 101.

122. **Thesis.** Four credit hours. Civil Engineering, fourth year, second semester. Prerequisite, Course 119.

123. **Trusses.** Lectures, recitations, and drawing. Three credit hours. Ceramic, and Mechanical Engineering, fourth year, first semester. Drawing the last three or four weeks. Prerequisite, Mechanics 102, or 104.

124. Repetition Course of 123. Architecture and Mine Engineering, third year, second semester. Concurrent, Mechanics 102, or 104.

125. **Tall Buildings.** Three credit hours. Three lectures weekly. Architecture, fourth year, first semester. Prerequisite, Course 124.

126. **Timber and Masonry.** Two credit hours. Two lectures and recitations weekly. Mechanical Engineering, third year, second semester. Concurrent, Mechanics, 102.

128. **Plane Surveying.** Two credit hours. Two lectures and one field exercise of three hours per week. Architecture, fourth year, second semester, and Mechanical Engineering, second year, second semester. Prerequisite, Engineering Drawing 102, Mathematics 132.

GRADUATE WORK

201-202. **Investigation and Design.** Three to ten credit hours. The year. Library, conference, and laboratory work. Time arranged with the instructor. Prerequisite, the permission of the instructor in charge. Work in Railroad and Topographic Engineering is conducted under the supervision of Professor Sherman; in Bridge and Structural Engineering under Professor Morris; in Municipal and Sanitary Engineering under Professor Eno; in Stereotomy and Masonry Construction under Assistant Professors Schlafly and Chamberlin.

203-204. Research Work. Three to ten credit hours. The year. Library, conference, and laboratory work. Time arranged with the instructor. Prerequisite, the permission of the instructor. For Division of the field and personnel, see Course 201-202.

DAIRYING

(Office, Townshend Hall)

PROFESSOR ERF, ASSISTANT PROFESSOR CUNNINGHAM,
MR. CLEVENGER

101. Principles of Dairying. Four credit hours. First semester.

102. Farm Dairying. Four credit hours. Second semester.

103 or 104. City Milk Supply. Two credit hours. First or second semester.

105 or 106. Buttermaking. Five credit hours. First semester, and repeated in the second semester.

107 or 108. Cheesemaking. Three credit hours. First semester and repeated in the second semester.

109. Elementary Dairying. Four credit hours. First semester. For students in two-year course in Agriculture.

110. Ice-Cream Making and Milk Condensing. Five credit hours. Second semester.

111. Dairy Mechanics. Three credit hours. First semester.

113-114. Advanced Dairying. Three credit hours. The year.

117-118. Advanced Dairying. Five to ten credit hours. Second semester.

This course is intended for graduate students.

DOMESTIC SCIENCE

(Hayes Hall)

PROFESSOR WARDALL, ASSOCIATE PROFESSOR WHITE,
MISS BLOHM, MISS CRANE

I. DOMESTIC SCIENCE

101-102. Foods. Four credit hours. The year. Prerequisite, Chemistry 106 or 110.

103. Dietetics. First semester. Four credit hours. Prerequisite, Course 101-102, Physiology 101, and Agricultural Chemistry 123-124.

104. The House. Three credit hours. Second semester.

105-106. Seminar. Two credit hours. The year. Open only to Fourth year and graduate students.

107. Household Management. Three credit hours. First semester. Prerequisite, Course 101-102, and Economics 135-136 or 138.

108. Teacher's Course. Three credit hours. Second semester. Open to seniors.

II. DOMESTIC ART

101-102. Textiles. Two credit hours. The year. Prerequisite, or concurrent, Art 101-102.

103. Dress. Three credit hours. First semester. Prerequisite. Course 101-102. Art 105-106 must be taken with this work.

104. Household Art. Three credit hours. Second semester. Prerequisite, or concurrent, Art 105-106.

***105. Teacher's Course.** Three credit hours. First semester. Prerequisite, Courses 101-102, 103 and 104.

106. Dress. Three credit hours. Second semester.

NOTE.—In all courses students provide their own materials.

DRAWING

(See Engineering Drawing and Art)

ECONOMICS AND SOCIOLOGY

(Office, Room 211, University Hall)

PROFESSORS HAGERTY, HAMMOND, AND GEPHART, ASSOCIATE PROFESSOR MCKENZIE, ASSISTANT PROFESSORS LOCKHART AND HUNTINGTON, MISS SHEETS, DR. WALRADT, AND MR. MILLS.

I. ECONOMICS

UNDERGRADUATE COURSES

131. Economic and Social History of England and the United States. Three credit hours. First semester.

132. Repetition of Course 131. Three credit hours. Second semester.

133. Economic Geography. Three credit hours. First semester.

134. Repetition of 133. Three credit hours. Second semester.

135-136. Principles of Economics. Three credit hours. The year. Should precede all courses in Economics except Economics 131, 132, 133, 134.

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*Not given 1912-1913.

135a. Repetition of 136.

136a. Repetition of 135.

138. **Principles of Economics.** Five credit hours. Second semester. Open only to students in Domestic Science and Domestic Art.

139-140. **The Elements of Accounting.** Two credit hours. The year. Prerequisite, registration in Course 135-136.

141. **Public Finance.** Two credit hours. First semester. Prerequisite, Course 135-136.

142. **Financial History of the United States.** Two credit hours. Second semester. Prerequisite, Course 135-136.

143. **Business Law.** Three credit hours. First semester. Preceded or accompanied by Course 135-136.

145-146. **Senior Seminar in Economics.** Two credit hours. The year. A course of individual investigation and class discussion of practical economic problems. Recommended to students who have had at least two years' work in Economics. Open to students who have obtained permission of the instructor.

*152. **Business Statistics.** Three credit hours. Second semester. Prerequisite, Course 135-136.

153. **Money and Currency.** Three credit hours, First semester. Prerequisite, Course 135-136.

*154. **Banking and the Money Market.** Three credit hours. Second semester. Prerequisite, Course 153.

155. **Municipal Economics and Finance.** Three credit hours. Second semester. Prerequisite, Course 135-136.

157. **Life Insurance.** Two credit hours. First semester. Prerequisite, Course 135-136.

158. **Property Insurance.** Two credit hours. Second semester. Prerequisite, Course 135-136.

159. **Commercial Development.** Three credit hours. First semester. Prerequisite, Course 135-136.

160. **Commercial Policies.** Three credit hours. Second semester. Prerequisite, Course 135-136.

*161. **Mercantile Institutions in Domestic Trade.** Three credit hours. First semester. Prerequisite, Course 135-136.

*162. **Foreign Markets and the Consular System.** Three credit hours. Second semester. Prerequisite, Course 135-136.

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*Not given in 1912-1913.

163. **Corporation Economics.** Three credit hours. First semester. Prerequisite, Course 135-136.

164. **Industrial Organization.** Three credit hours. Second semester. Prerequisite, Course 135-136.

165. **Labor Legislation.** Three credit hours. First semester. Prerequisite, Course 135-136.

166. **Organization and Remuneration of Labor.** Three credit hours. Second semester. Prerequisite, Course 135-136.

*167. **Railway Economics.** Three credit hours. First semester. Prerequisite, Course 135-136.

*168. **Railway Organization and Administration.** Three credit hours. Second semester. Prerequisite, Course 135-136.

171. **Principles of Accounting.** Three credit hours. First semester. Prerequisite, Course 139-140.

172. **Cost Accounting.** Three credit hours. Second semester. Prerequisite, Course 171 or 173.

173. **Accounting Practise.** Three credit hours. First semester. Prerequisite, Course 139-140.

*174. **Auditing.** Three credit hours. Second semester. Prerequisite, Course 171.

*175. **Principles of Advertising.** Two credit hours. First semester.

II. SOCIOLOGY

101-102. **Principles of Sociology.** Three credit hours. The year. Not open to first year students.

103. **The Negro.** Three credit hours. First semester. Prerequisite, Course 101-102.

104. **The Immigrant.** Three credit hours. Second semester. Prerequisite, Course 101-102.

*105. **The Indian.** Three credit hours. First semester. Prerequisite, Course 101-102.

107. **The Family.** Three credit hours. First semester. Prerequisite, Course 101-102.

108. **Primitive Man in Ohio.** One credit hour. Second semester. Prerequisite, Course 101-102.

109. **Modern Charity.** Three credit hours. First semester. Prerequisite, Course 101-102.

110. **Criminology.** Three credit hours. Second semester. Prerequisite, Course 101-102.

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*Not given in 1912-1913.

*111. **Poverty.** Three credit hours. First semester. Prerequisite, Course 101-102.

*112. **Preventive Philanthrophy.** Three credit hours. Second semester. Prerequisite, Course 109 or 111.

*113. **Historic Socialism and Social Reform.** Three credit hours. First semester. Prerequisite, Course 101-102, or Economics, 135-136.

114. **Recent Socialism and Social Reform.** Three credit hours. Second semester. Prerequisite, Course 101-102, or Economics 135-136.

115-116. **Field Work in Sociology.** Two credit hours. One or two semesters. Open only to graduates and seniors who have had two years' work in Sociology.

117-118. **Seminar in Sociology.** Two credit hours. The year. Open to graduates and advanced undergraduates.

120. **The Household.** Three credit hours. Second semester. Prerequisite, Course 101-102.

122. **Sociology.** Five credit hours. Second semester.

GRADUATE WORK

201-202. **Advanced Sociology.** Two hours. The year. Prerequisite, Sociology 101-102.

203-204. **Distribution of Wealth.** Three hours. The year.

*205-206. **The State in its Relation to Industry and Labor.** Two credit hours. The year.

207-208. **Graduate Seminar in Economics and Sociology.** Two credit hours. The year.

EDUCATION

(See History and Philosophy of Education, School Administration and Psychology)

ELECTRICAL ENGINEERING

(Office, Room 171, Engineering Laboratory)

PROFESSORS CALDWELL AND HUNT, MR. SHEPARDSON, MR. HEITMANN, MR. MAINLAND.

101. **Electrical Engineering.** Five credit hours. Three lectures and one four-hour laboratory period weekly. Chemical Engineering, and Mechanical Engineering, fourth year, first semester. Prerequisite, Physics, 112 or 114.

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*Not given in 1912-1913.

103. **Electrical Engineering.** Three credit hours. Two lectures and one three-hour laboratory period weekly. Civil Engineering, third year, Mine Engineering, fourth year, first semester. Prerequisite, Physics 112, or 114.

104. **Direct Current Machinery** Five credit hours. Three lectures and one four-hour laboratory period weekly. Electrical Engineering, third year, second semester. Prerequisites, Physics 135, Mathematics 142, and Mechanics 101.

106. **Applications of Electricity.** Three hours for one-half semester. Three lectures per week. Electrical Engineering, third year, second semester. Prerequisites, Physics 135, and Mathematics 142.

108. **Alternating Current Circuits and Machinery.** Three hours for one-half semester. Electrical Engineering, third year, second half of second semester. Prerequisites, Mathematics 142, Physics 135, Mechanics 101,and Electrical Engineering 106.

109. **Alternating Current Machinery.** A continuation of Electrical Engineering 108. Three credit hours. Three lectures weekly. Electrical Engineering, fourth year, first semester. Prerequisites, Electrical Engineering 108, and concurrent, Electrical Engineering 111.

111. **Alternating Current Laboratory.** Three credit hours. Electrical Engineering, fourth year, first semester. Prerequisite, Electrical Engineering 108. Concurrent, Electrical Engineering 109.

112. **Advanced Alternating Current Laboratory.** Three credit hours. Electrical Engineering fourth year, second semester. Prerequisite, Electrical Engineering 109 and 111.

113. **Electrical Railways.** Two credit hours. Electrical Engineering, fourth year, first semester. Alternative with Electrical Engineering 115, 117, and 119. Prerequisite, Electrical Engineering 104, Concurrent Electrical Engineering 109.

115. **Telephony.** Two credit hours. Electrical Engineering, fourth year, first semester. Alternative with Electrical Engineering 113, 117, and 119. Prerequisite, Electrical Engineering 104 and 108.

117. **Electrical Illumination.** Two credit hours. Electrical Engineering, fourth year, first semester. Alternative with Electrical Engineering 113, 115, and 119. Prerequisites, Electrical Engineering 104 and 108.

119. **Wireless Telegraphy.** Two credit hours. Electrical Engineering, fourth year, first semester. Alternative with Electrical Engineering 113, 115, and 117. Prerequisites, Electrical Engineering 104 and 108.

121. Electrical Design. Three credit hours. Two lectures and one four-hour drawing period weekly. Electrical Engineering, fourth year, first semester. Prerequisite, Electrical Engineering 104.

122. Electrical Design. Two credit hours. A continuation of Electrical Engineering 121. One lecture and one three-hour drawing period weekly. Electrical Engineering, fourth year, second semester. Elective.

124. Electrical Transmission and Distribution. Two credit hours. Two lectures weekly. Electrical Engineering, fourth year, second semester. Prerequisite, Electrical Engineering 109.

125. Special Reading and Laboratory. Credit hours to be arranged. Elective for fourth year Electrical Engineering and graduate students with consent of the instructor in charge. First semester. Prerequisites, Electrical Engineering 104 and 108.

126. Special Reading and Laboratory. A continuation of Electrical Engineering 125. Second semester.

127. Thesis. One credit hour. Electrical Engineering, fourth year, first semester. Prerequisites, Electrical Engineering 104 and 108.

128. Thesis. Five credit hours. Electrical Engineering, fourth year, second semester.

130. Inspection Trip to the East. Given only in the even years the seventh week before Commencement. Electrical Engineering, third or fourth year.

Includes Pittsburg, Buffalo, Niagara, and Cleveland. The entire expense need not exceed $32. A satisfactory written report is required.

132. Inspection Trip to the West. Given only in the odd years the seventh week before Commencement. Electrical Engineering, third or fourth year.

Includes Chicago, Milwaukee, and Fort Wayne. The entire expense need not exceed $32. A satisfactory written report is required.

134. Reading Course. Electrical Engineering, third or fourth years. This may be taken as a substitute for Electrical Engineering 130 on presentation of reasons satisfactory to the head of the department.

136. Reading Course. Electrical Engineering, third or fourth years. This may be taken as a substitute for Electrical Engineering 132 on presentation of reasons satisfactory to the head of the department.

GRADUATE WORK

201-202. Advanced Alternating Current Machinery. Two credit hours. The year.

203-204. Transient Electrical Phenomena. Two credit hours. The year.

205-206. Advanced Alternating Current Dynamo Laboratory. Two credit hours. The year.

207-208. Research Work. Three to five credit hours. The year. Time to be arranged with the instructor. Prerequisite, permission of the instructor in charge. Library, conference, and laboratory work.

ENGINEERING DRAWING

(Office, Room 42, Brown Hall)

PROFESSOR FRENCH, ASSISTANT PROFESSOR MEIKLEJOHN,
MR. WILLIAMS, MR. HARPER, MR. SHEETS, MR. IVES,
MR. TURNBULL, MR. NORRIS, MR. GILBERT.

101. Elementary Mechanical Drawing. Two credit hours. All four-year Engineering courses, first year, first semester.

102. Mechanical Drawing. Three credit hours. All four-year Engineering courses, first year, second semester. Prerequisite, Course 101.

103. Descriptive Geometry. Three credit hours. Two recitations, one drawing period weekly. Ceramic, chemical, electrical, mechanical and mining engineering second year, first semester. Prerequisite, Course 102 or 114.

104. Machine Sketching. Three credit hours. One lecture, two drawing periods weekly. Ceramic, chemical, mechanical and mine engineering, second year, second semester. Prerequisite, Course 103.

105. Descriptive Geometry. Three credit hours. Two lectures, one drawing period weekly. Civil Engineering, second year, first semester. Prerequisite, Course 102.

106. Advanced Descriptive Geometry. Three credit hours. Two lectures, one drawing period weekly. Civil Engineering, second year, second semester. Prerequisite, Course 105.

107. Descriptive Geometry. Three credit hours. Architecture, second year, first semester. Prerequisite, Course 102.

110. Technical Sketching. Two credit hours. Electrical Engineering, second year, first semester. Prerequisite, Course 103.

111. Technical Drawing. Two credit hours. Mechanical and Electrical Engineering, third year, first semester. Prerequisite, Course 104 or 110.

113. **Free-hand Drawing and Lettering.** Four credit hours. Short courses in Clay Working and Industrial Arts, first year, first semester. Short mining course, second year, first semester.

114. **Mechanical Drawing.** Three credit hours. Short courses in Clay Working and Industrial Arts, first year, second semester. Short mining, second year, second semester. Prerequisite, Course 113.

115. **Charcoal from Architectural Ornament.** Two credit hours. Architecture, second year, first semester.

116. **Pen Drawing.** Two credit hours. Architecture, second year, second semester.

117. **Water Color.** Three credit hours. Architecture, third year, first semester.

118. **Charcoal Drawing from the Antique.** Three credit hours. Architecture, third year, second semester. Prerequisite, Course 115.

119. **Clay Modeling.** Two credit hours. Architecture, fourth year, first semester. Prerequisite, Course 115.

121. **Technical Drawing.** Two credit hours. Designing of chemical plants and machinery. Chemical Engineering, third year, first semester. Prerequisite, Course 104.

122. **Technical Drawing.** Two credit hours. Continuation of 121. Chemical Engineering, third year, second semester.

125. **Mechanical Drawing.** Two credit hours. First semester. Agriculture, first year.

126. Repetition of 125.

127. **Mechanical Drawing.** One and one-half credit hours. First semester.

128. **House Planning.** One and one-half credit hours. Second semester. Prerequisite, Course 127.

129. **Lettering.** One credit hour. First semester. Pharmacy, second year.

130. **Technical Drawing.** Two credit hours. Second semester. Pharmacy, second year.

131. **The Teaching of Mechanical Drawing.** Three credit hours. First semester. Education, third year.

132. **The Teaching of Mechanical Drawing.** Three credit hours. Second semester. Education, third year.

This course includes lettering in design.

135-136. **Technical Delineation.** Two credit hours. The year.

Course 135-136 is designed for students in biological work and provides training in rendering in pencil, pen and ink, and brush.

137. **Engineering Drawing.** Two credit hours. First semester. Prerequisite, Course 101.

This course is elective and designed especially for students in Forestry.

138. Continuation of 137. Two credit hours. Second semester.

ENGLISH

(Office, Room 202, English Building)

PROFESSORS DENNEY, TAYLOR, MCKNIGHT, ASSOCIATE PROFESSOR GRAVES, ASSISTANT PROFESSORS DUNCAN, BLANCHARD, COOPER, HARRINGTON, AND BECK

101. **Paragraph Writing. Description and Narration.** Two credit hours. First semester. Text: Scott and Denney's Paragraph Writing.

102. Repetition of Course 101. Second semester.

104. **Paragraph Writing. Exposition and Argumentation.** Two credit hours. Second semester. Prerequisite, Course 101. Same hours as for Course 101. (Course 104 is also offered in the Summer Session.)

107. **Advanced Description and Narration.** Two credit hours. First semester. Prerequisite, Course 101.

108. **Advanced Exposition and Criticism.** Two credit hours. Second semester. Prerequisite, Course 101.

111-112. **Advanced Argumentative Writing.** Two credit hours. The year. Prerequisite, Course 104.

113. **News Collecting and News Writing.** Two credit hours. First semester. Prerequisite, Courses 101 and 104.

Attention is given to vocabulary and style, with drill in the gathering of news through exercises and assignments. The work of the reporter will be considered in connection with a discussion of the organization of the newspaper. Students will be sent to cover actual stories throughout the city. Newspaper men will address the class.

114. **Newspaper Correspondence.** Two credit hours. Second semester.

A continuation of Course 113 with the addition of newspaper correspondence and feature writing.

115. **Newspaper Practise.** Three credit hours. First semester. Prerequisite Courses 113 and 114.

An advanced course intended for students who are doing work on the University or city papers. These students will be given various assignments. Practise in writing of headlines, editing of newspaper copy, make-up and reading of proof will be included in the course. Weekly consultation with the instructor.

116. **Newspaper Practise.** Three credit hours. Second semester. A continuation of Course 115 with the addition of work in the writing and display of advertising matter. Prerequisite, Courses 113 and 114.

117. **Editorial Work.** Two credit hours. First semester. Prerequisite, Courses 113, 114, 115, 116.

The planning and writing of magazine and trade-journal articles will be treated in this course, as well as the special problems of technical journalism.

118. **Newspaper Problems.** Two credit hours. Second semester. Prerequisite, Course 117.

The evolution of the newspaper will be treated in some detail and attention will be given to a comparative study of the newspaper of to-day and to the discussion of newspaper problems, including the work of the country editor.

121. **Principles of Public Speaking.** Two credit hours. First semester. Prerequisite, Courses 101 and 104.

122. **Debating.** Two credit hours. Second semester. Prerequisite, Courses 101 and 104.

123. **Advanced Debating.** Two credit hours. First semester. Prerequisite, Course 122.

124. **Extempore Speaking.** Two credit hours. Second semester. Prerequisite, Course 122.

127. **History of the English Language.** Two credit hours. First semester. No prerequisite course. Designed for students without a knowledge of Old and Middle English. The development of the language is traced by means of illustrative specimens. Attention is paid to the history of spelling and pronunciation, the changes in the meaning of the words, and the origin of modern idioms.

128. **English Words.** Two credit hours. Second semester. No prerequisite course. Text-book: Greenough and Kittredge's Words and Their Ways in English Speech.

*129. **The English Bible. Narrative Forms.** Two credit hours. First semester. No prerequisite course.

*130. **The English Bible. Poetic Forms.** Two credit hours. Second semester. No prerequisite course.

131. **Survey of English Literature.** Three credit hours. First semester. No prerequisite course.

The outline of the history of English Literature will be given by lecture. The following will be read: Shakespeare's Richard III,

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*Not given 1912-1913

Twelfth Night, Coriolanus; Milton's Paradise Lost, Books III, IV, Bunyan's Pilgrim's Progress, Pt. I; Dryden's Palamon and Arcite; Addison's Essays; Pope's Rape of the Lock; Goldsmith's Essays; Scott's Kenilworth; Byron's Mazeppa; Carlyle's Essay on Biography.

European History 103-104 (Narrative History) is recommended in connection with this course.

132. Repetition of 131.

133. **Survey of American Literature.** Three credit hours. First semester. No prerequisite course.

The outline of the history will be given by lecture. The reading and criticism will be of Irving, Cooper, Bryant, and Poe; of Hawthorne, Emerson, Whittier, Longfellow, and Lowell; and of Walt Whitman, with a brief survey of recent literature.

134. Repetition of 133.

135. **The Age of Elizabeth.** (Exclusive of the drama) Two credit hours. First semester. Prerequisite, Course 131 or 132.

136. **The Age of Milton.** Two credit hours. Second semester Prerequisite, Course 131 or 132.

137. **Eighteenth Century Literature (Poetry, Essays, Letters).** Two credit hours. First semester. Prerequisite Course 131-132.

138. **Nineteenth Century Essayists.** Two credit hours. Second semester. Prerequisite, Course 131 or 132.

139. **The Romantic Movement.** Two credit hours. First semester. Prerequisite, Course 131 or 132.

A study of the rise and progress of the new poetic movement during the last years of the eighteenth and the earlier years of the nineteenth century. The poetry of Thomson, Cowper, Gray, Blake, Collins, and Burns.

140. **Wordsworth and his Period.** Two credit hours. Second semester. Prerequisite, Course 131 or 132.

The poetry of Wordsworth, Byron, Shelley, and Keats.

141. **Tennyson.** Three credit hours. First semester. Prerequisite, Course 131 or 132.

The whole of Tennyson will be read and criticized and rapid consideration given to Fitzgerald, Arnold, Swineburne, Rossetti, and Morris.

142. **Browning.** Three credit hours. Second semester. Prerequisite, Course 131 or 132.

The whole of Browning will be read and criticized, with some consideration of the poetry of George Meredith, and of their influence on recent literature.

151. **Old English.** Three credit hours. First semester.

Old English prose and poetry as found in Bright's Anglo-Saxon Reader.

152. **Old and Middle English.** Three credit hours. Second semester.

Bewoulf, followed by selections illustrating the language and literature from the Norman Conquest to time of Chaucer.

153. **Chaucer.** Two credit hours. First semester.

Chaucer's principal works are read. Brief consideration is given to Chaucer's contemporaries, Gower, Wycliffe, Langland, and the author of Sir Gawayne and The Grene Knight.

154. **English Fiction to Richardson.** Two credit hours. Second semester.

A rapid survey, by means of modern versions, of early epic poetry and mediæval romance, followed by a study of the types of novel in the sixteenth and seventeenth centuries.

155. **The Novel. Richardson to Scott.** Three credit hours. First semester.

The history of the development of the novel in the period is given by lecture. Reading and criticism of Richardson, Fielding, Sterne, Jane Austen, and Scott.

156. **The Novel. Dickens to Meredith.** Three credit hours. Second semester.

The history and development of the novel in this period is given by lecture. Reading and criticism of Dickens, Thackeray, George Eliot, and George Meredith.

157. **Versification.** Three credit hours. First semester.

The theory of verse structure with a history of the principal English rhythms, and practise in verse composition.

158. **The Short Story.** Three credit hours. Second semester.

Lectures on structure and form in the short story, with class reports on assigned readings, and practise in story writing.

165. **Mysteries, Moralities and Interludes.** Two credit hours. First semester.

Manly's Specimens of Pre-Shakespearean Drama is made the basis of this course. Outside study in the complete collections is also prescribed.

166. **The Drama from 1580 to 1642 (Exclusive of Shakespeare).** Two credit hours. Second semester.

One or two plays of each of the principal contemporaries and immediate successors of Shakespeare; lectures on the history of the drama in this period.

167. **Shakespeare. Histories and Tragedies.** Three credit hours. First semester.

All of the plays are read with a view to complete criticism.

168. **Shakespeare. Comedies and Romances.** Three credit hours. Second semester.

All of the plays are read with a view to complete criticism.

169. **Modern English Drama, 1660-1802.** Two credit hours. First semester.

Representative plays of the principal writers are read; lectures on the history of the drama in this period.

170. **Modern English Drama, Ninteenth Century.** Two credit hours. Second semester.

The reading of representative plays is accompanied by lectures on the history of the drama in the nineteenth century. Some attention is paid to American plays.

182. **The Teaching of English.** Two credit hours. Second semester. Prerequisite, ten semester hours of English.

GRADUATE WORK

201. **The Beginning of the Short Story.** Two credit hours. First semester.

An investigation of types of the short story in English from the Middle Ages to the present.

202. **The Lyric.** Two credit hours. Second semester.

A study of the characteristics of lyrical poetry with a history of the lyric in English literature,

*203. **Piers Plowman.** Two credit hours. First semester.

A study of the form and content of the three versions of the Vision Concerning Piers Plowman, and of the pictures of contemporary life afforded. Attention is paid to the recent discussion concerning authorship.

*204. **The Author of Sir Gawayne and the Grene Knight.** Two credit hours. Second semester.

An attempt to become acquainted with the personality of this anonymous writer and to arrive at a conclusion concerning his much debated purpose in his poem, The Pearl.

205. **History of Critical Theory.** Two credit hours. First semester.

Saintsbury's Loci Critici is used as the basis of individual investigations.

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*Not given 1912-1913

206. **Problems in the Drama.** Two credit hours. Second semester.

Lectures on the history of dramatic theory. Each student is assigned a specific problem for individual research and weekly report.

207. **Meredith, Hardy, James.** Two credit hours. First semester.

208. **Poetry and the Drama Since 1880.** Two credit hours. Seconds emester.

209. **English and Scottish Popular Ballads.** Two credit hours. First semester.

210. **English Usage.** Two credit hours. Second semester.

219-220. **Discussions of Dissertations.** Two credit hours. The year.

ENTOMOLOGY

(See Zoology and Entomology)

EUROPEAN HISTORY

(Office, Room 204, University Hall)

PROFESSOR SIEBERT, ASSOCIATE PROFFESOR MCNEAL, ASSISTANT PROFESSOR PERKINS

101. **Medieval History.** Three credit hours. First semester.

102. **Modern History from 1500 A. D.** Three credit hours. Second semester.

103-104. **History of England.** Three credit hours. The year. Introductory course.

105. **History of Greece.** Three credit hours. First semester.

106. **History of Rome.** Three credit hours. Second semester.

107-108. **Medieval Civilization.** Two credit hours. The year. Prerequisite, Courses 101 and 102.

109. **The Age of the Renaissance, 1250 to 1500 A. D.** Three credit hours. First semester. Prerequisite, Courses 101 and 103.

110. **The Period of the Reformation.** Three credit hours. Second semester. Prerequisite, Courses 101 and 102.

111. **The French Revolutionary and Napoleonic Periods, 1789-1815.** Three credit hours. First semester. Prerequisite, Courses 101 and 102.

112. **Europe in the Nineteenth Century.** Three credit hours. Second semester. Prerequisite, Courses 101 and 102,

Especial emphasis on the past fifty years and the interpretation of recent events in Europe.

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*Not given in 1912-1913.

113-114. Constitutional History of England. Three credit hours. The year. Prerequisite, Courses 101 and 102.

***115. Europe and Africa, India and Australia.** Two credit hours. First semester. Prerequisite, Courses 101 and 102.

***116. Europe and Turkey. The Eastern Question.** Two credit hours. Second semester. Prerequisite, Courses 101 and 102.

117. Northeastern Europe. Two credit hours. First semester. Prerequisite, Courses 101 and 102.

118. Europe and Asia. The Far Eastern Question. Two credit hours. Second semester. Prerequisite, Courses 101 and 102.

***119-120. History of Germany.** Two credit hours. The year.

The emphasis will be laid on the modern period beginning with the Renaissance and the Protestant Revolt.

121-122. History of France. Two credit hours. The year.

152. Teachers' Course in European History. Two credit hours. Second semester.

GRADUATE WORK

201-202. Seminar in Medieval History. Reading of the sources of some period in the Middle Age. Two hours. The year. Open only by permission of instructor.

203-204. Seminar in Modern European History. Two hours. The year. Open only by permission of instructor.

FORESTRY

(Horticultural Hall)

PROFESSOR LAZENBY, INSTRUCTOR GOETZ, MR. PFLUEGER

101. Introduction to Forestry. Two credit hours. First semester.

102. Introduction to Forestry. Two credit hours. Second semester.

104. Arboriculture and Tree Surgery. Three credit hours. Second semester.

105. Silviculture. Three credit hours. First semester.

106. Silviculture. Three credit hours. Second semester.

107. Forest Mensuration, Valuation and Timber Physics. Four credit hours. First semester.

108. Forest Utilization and Lumbering. Four credit hours. Second semester.

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*Not given in 1912-1913.

109. Forest History. Relations and Management. Four credit hours. First semester.

110. Forest Economics and Policies. Four credit hours. Second semester.

FRENCH

(See Romance Languages)

GEOLOGY

(Office, Room 1, Orton Hall)

PROFESSOR PROSSER, PROFESSOR BOWNOCKER, ASSISTANT PROFESSOR HILLS, MR. MORSE, MISS MARK

101-102. Physiography. Three credit hours. The year. Open to freshmen and sophomores only.

Three field trips are made Saturdays in each semester, each trip taking the place of a recitation. From October 31 until the end of the semester, the Monday recitation is replaced by laboratory work.

103. Inorganic Geology. Three credit hours. First semester.

104. Historical Geology. Three credit hours. Second semester. Lectures. Prerequisite, Course 103.

[Courses 103 and 104 are considered as forming a general course in geology which is required before advanced work in physiography, historical or inorganic geology.]

105. Field Geology. Three to five credit hours. First semester. Lectures, assigned reading, field trips and laboratory work. Field trips generally on Saturdays while weather permits, laboratory work for the remainder of the semester. Prerequisite, Courses 103 and 104.

106. Glacial Geology. Three credit hours. Second semester. Prerequisite, Courses 103 and 104.

107-108. Paleontology. Two to five credit hours. The year. Laboratory open afternoons, 1 to 4, and on certain days in the morning. Prerequisite, Courses 103 and 104.

109-110. Microscopical Petrography. Two to five credit hours. The year. Prerequisite, Chemistry, Mineralogy, and Geology 103 and 104.

111-112. Advanced Physiography. Three to five credit hours. The year. Prerequisite, Courses 101-102, 103 and 104, or 103 and 104 concurrently.

113-114 Areal Geology. Two to five credit hours. The year. Field work fall and spring, laboratory work in winter. Laboratory open afternoons, 1 to 4. Prerequisite, Courses 103 and 104, 105 and 106, and 107-108 for Paleozoic group, and 101-102, 103 and 104, and 105 and 106 for Cenozoic group.

115. Economic Resources of the United States. One credit hour. First semester. Must be taken in conjunction with Course 167. Prerequisite, Geology 101-102, or 103 and 104, and Economics 135 and 136.

141-142. Minor Investigations and Current Literature. Two to five credit hours. The year. A study of special topics and current literature in geology. Assigned readings, conferences, and reports. (a) HISTORICAL GEOLOGY. Prerequisite, Courses 103 and 104, Course 101-102 is recommended. Professor PROSSER. (b) INORGANIC GEOLOGY. Prerequisite, Course 167. Professor BOWNOCKER. (3) PHYSIOGRAPHY. Prerequisite, Geology 101-102, 103 and 104, Assistant Professor HILLS.

152. General Geology. Three credit hours. Second semester. Geology 165 repeated.

153. Applied Geology. Three credit hours. First semester. Prerequisite, 165 or 152.

162. Elementary Physiography. Four credit hours. Short mining, first year, second semester.

164. Elementary Geology. Three credit hours. Second semester.

165. General Geology. Three credit hours. First semester

166. Petrography. Two credit hours. Second semester.

167. Economic Geology. Three credit hours. First semester.

167a. Economic Resources of the United States. One credit hour. First semester. Must be taken in conjunction with Geology 167. Prerequisite, a course in the principles of economics.

168. General Geology. Three credit hours. Ceramic Engineering, fourth year, Civil Engineering, second year, second semester.

175-176. The Teaching of Physiography. Two credit hours. The year. Prerequisites, Course 101-102, or equivalent.

GRADUATE WORK

201-202. Advanced Historical Geology. Three to five hours. The year. Laboratory open afternoons, 1 to 4. Prerequisite, Courses 103, 104, and 107-108.

203-204. Research Work. Three to five credit hours. The year. Prerequisite, preceding courses in inorganic or historical geology. Field, laboratory, and library study is offered along three lines. Outline of work and time will be arranged with individual students. (a) STRATIGRAPHY AND PALEONTOLOGY. The investigations of some field problem in stratigraphy with laboratary and library study or of some special subject in paleontology. Professor PROSSER. (b) ECONOMIC GEOLOGY. The investigation of some field problem in petroleum, natural gas, coal, or salt. Professor BOWNOCKER. (c) PHYSIOGRAPHY. Field problems, experimental studies in the laboratory or investigations in the literature. Assistant Professor HILLS.

GERMAN

(Offices, Rooms 317, 318, University Hall)

PROFESSOR EVANS, ASSOCIATE PROFESSOR EISENLOHR, ASSISTANT PROFESSORS THOMAS, BARROWS and LEWISOHN, DR. BUSEY

101-102. **Elementary German.** Four credit hours. The year. Eight sections. All instructors.

The essentials of Grammar and the reading of easy German narrative prose.

103. **Intermediate German.** Four credit hours. First semester. Eight sections. Prerequisite, Course 101-102 or two entrance units. Not open to students who enter with four entrance units in German. All instructors.

Reading of more difficult prose; topical review of grammar; syntax; prose composition.

104. **Easy Classical Reading and Composition.** Four credit hours. Second semester. Five sections. Prerequisite, Course 103 or three entrance units. Not open to students who enter with four entrance units.

Reading of (a) a classical drama supplemented by discussions and lectures on the structure of the drama, its characters, and its historical background; (b) other selections from the classical period of the nineteenth century; prose composition.

106. **Science Reading.** Four credit hours. Second semester. Three sections. Prerequisite, Course 103, or three entrance units.

Rapid reading of technical literature. This is preceded or accompanied by drill on word formation, word compounds, and sentence structure. The object of the course is to enable the student to read German technical literature.

107-108. **Advanced German.** Four credit hours. The year. Modern and classical prose and verse. Oral and written practise. Open only to freshmen with four entrance units in German.

115-116. **Classical and Modern Writers.** Two credit hours. The year.

Selections from eighteenth and nineteenth century writers; written and oral exercises.

117-118 **Schiller.** Introduction to life and works. Two credit hours. The year. First semester: Gedichte, Don Carlos, Braut von Messina; second semester: Wallenstein, Dreissigjaehriger Krieg.

119-120. **Nineteenth Century Drama.** Two credit hours. The year.

Selected dramas read and interpreted in class. The interpretation will take the form of simple lectures in German to be reproduced orally and in writing by the student. First semester: Selections from Kleist, Grillparzer, Hebbel, Ludwig; second semester: Selections from Wildenbruch, Sudermann, Hauptmann, Fulda.

*123-124. **Nineteenth Century Novel.** Two credit hours. The year.

This course will be identical in aim and method with Course 119-120 with which it alternates.

131-132. **Conversation and Prose Composition.** Two credit hours. The year. Prerequisite, consent of the instructor.

Courses 115-132, not open to freshmen, require as prerequisite, Course 104 or its equivalent. Courses 115-116, offering a considerable amount of intensive oral and written work is especially recommended for students desiring to take German as a major subject. Courses 117-124 are primarily reading courses. **No student may elect more than two year courses in the group 107 to 124.** A combination of Course 131-132 with one of the Courses 115 to 124 is advised.

Prerequisite for the following Courses is: At least one year course in the group 107-124 or the equivalent.

*151-152. **Goethe.** Introduction to life and works. Three credit hours. The year.

First semester: Selections from lyrics, earlier dramas and prose. Second semester: Faust.

153-154. **Survey of German Literature.** Three credit hours. The year.

Lectures, interpretation of selected texts and parallel readings. First semester: From the beginning to Lessing. Second semester. Classical period and nineteenth century.

155-156. **Lessing.** (Introduction to Life and Works.) Two credit hours. The year. First semester: Dramas. Second semester: Critical writings.

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*Not given in 1912-1913.

*157. **Volkslied.** Two credit hours. First semester.

Studies in the origin and growth of the German Folksong with special reference to German life and culture.

*158. **Volksbucher, Marchen und Sagen.** Two credit hours. Second semester.

Studies in popular and legendary literature.

*159. **Heine.** Introduction to life and works. Two credit hours. First semester.

*160. **Hebbel.** Introduction to life and works. Two credit hours. Second semester.

*161-162. **Romantic Writers.** Two credit hours. The year.

Lectures on the Romantic Movement with the reading of representative texts. First semester: Selections from Novalis, Tieck Arnim. Second semester: Selections from Eichendorff, Uhland, Hoffmann.

171-172. **Advanced Prose Composition.** Two credit hours. The year. Open only on consent of instructor.

173. **The Teaching of German.** Two credit hours. First semester.

A critical study of the methods of teaching modern foreign languages. Lectures, reports and practise teaching. Open only to seniors and graduate students.

174. **Grammar Review.** Two credit hours. Second semester.

A detailed discussion of theoretical grammar from the standpoint of the high school teacher. Open only to seniors and graduate students.

175. **Phonetics.** Two credit hours. First semester.

A study of speech sounds with special reference to German and English.

176. **Interpretative Reading.** Two credit hours. Second semester.

Practise in reading narrative and dramatic prose and verse with the memorizing of certain selections. Not open to graduate students for credit.

177. **Middle High German.** Two credit hours. First semester. Introductory course. Grammar and selected readings.

178. **History of the German Language.** Two credit hours. Second semester. Lectures and illustrative readings, with special reference to the needs of those intending to teach.

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*Not given in 1912-1913.

GRADUATE WORK

*201-202. **Advanced Middle High German.** Two credit hours. The year. A critical study of German literature in the 12th and 13th centuries.

*203. **Gothic.** Two credit hours. First semester. A philological and critical study of selections from the Bible of Ulfilas.

*204. **Old High German.** Two credit hours. Second semester. Studies in German Language and literature of the period.

205-206. **The Literature of the Empire.** (1870-1895). Two credit hours. The year. The rise and decline of the naturalistic school and the rise of neo-romanticism in connection with the parallel movements in philosophy and in French and English literature. Lectures, readings and special reports.

215-216. **Seminar in German Literature.** Two credit hours. The year. The aim is to train graduate students in the scientific methods of the historical and critical study of literature. The course will deal in alternate years with the historical development of the German drama up to Lessing and with the classical period. 1911-1912: History of the German Drama from the Renaissance to Lessing. 1912-1913: Schiller.

GREEK LANGUAGE AND LITERATURE

(Office, Room 307, University Hall)

PROFESSORS SMITH AND HODGMAN, MISS THOMAS.

101-102. **Elementary Greek.** Four credit hours. The year.

105. **Xenophon:** The Memorabilia of Socrates; exercises in Greek Prose. HERODOTUS: selections; with studies in Greek History. Four credit hours. First semester. Prerequisite, Course 101-102.

106. **Herodotus,** continued. HOMER: Odyssey, selections from Books I-IX. Four credit hours. Second semester. Prerequisite, Course 105.

107. **Lysias:** Eight Orations; with Studies in Attic Procedure. PLATO: Apology. Three credit hours. First semester. Prerequisite, Course 105 and 106.

108. **Plato:** Crito and Phædo. Homer: Iliad selections. Three credit hours. Second semester. Prerequisite, Course 105-107.

109. **Thucydides:** Book I or Book VII: DEMOSTHENES: Olynthiacs. Two credit hours. First semester. Prerequisite, Courses 105 and 106.

110. **Demosthenes:** Philippics. **Theocritus:** selections. Two credit hours. Second semester. Prerequisite, Courses 105-108.

111. **Attic Drama. Euripides:** Alcestis; **Sophocles:** Oedipus Tyrannus; with Lectures on Scenic Antiquities. Two credit hours. First semester. Prerequisite, Courses 105-108.

112. **Attic Drama.** Continuation of Course 111; two plays. Two credit hours. Second semester.

113. **Epic Poetry:** selections. **Aristophanes:** The Birds. Two credit hours. First semester. Prerequisite Courses 105-108.

114. **Aristophanes:** The Clouds. **Post-Classical Greek:** Lucian. Two credit hours. Second semester. Prerequisite, Courses 105-108.

*115. **Ancient Art.** Lectures on Architecture and Sculpture. Two credit hours. First semester. No prerequisite course.

*116. **Ancient Art.** Continuation of Course 115. Two credit hours. Second semester.

These courses are given biennially, alternating with Courses 117-118.

117. **Medieval Art.** Lectures on Architecture and Sculpture. Two credit hours. First semester. No prerequisite course.

118. **Medieval Art.** Lectures on Sculpture and Painting. Two credit hours. Second semester.

119. **Readings in Greek Philosophy.** Two credit hours. First semester. Prerequisite, Courses 105-108.

120. **Studies in New Testament Greek.** Two credit hours. Second semester. Prerequisite, Courses 105-108.

121-122. **Historical Grammar.** One credit hour. The year. Prerequisite, Courses 105-106.

123. **Life and Literature of the Greeks.** Lectures on Private Life and on Epic and Lyric Poetry. Two credit hours. First semester. No prerequisite course.

124. **History of Greek Literature.** Continuation of Course 123. Lectures on Dramatic Poets, Historians, Philosophers, and Orators. Two credit hours. Second semester.

Courses 123 and 124 are open to students without a knowledge of Greek.

HISTORY

(See American History and European History)

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*Not given in 1912-1913.

HISTORY AND PHILOSOPHY OF EDUCATION

(Office, Second Floor, Old Mechanical Building)

PROFESSOR F. P. GRAVES

101-102. **History of Education.** Three credit hours. The year. Prerequisite, Psychology 101-102.

103-104. **Philosophy of Education.** Two credit hours. The year. Prerequisite, Course 101-102, and Philosophy 151-152.

105-106. **Educational Classics.** Two credit hours. The year. Prerequisite Course 101-102.

107-108. **History of European School Systems.** Two credit hours. The year. Prerequisite, Course 101-102.

109-110. **History of Education in the United States.** Two credit hours. The year. Prerequisite, Course 107-108.

121-122. **Seminar in the History of Education.** One credit hour. The year. Prerequisite, Course 107-108.

123-124. **Seminar in Educational Philosophy.** One credit hour. The year. Prerequisite, Courses 103-104, 105-106, and Sociology 101-102.

HORTICULTURE

(Horticultural Hall)

PROFESSOR PADDOCK, ASSISTANT PROFESSORS DAVIS AND MONTGOMERY

101. **Principles of Horticulture** Four credit hours. First semester. Four year course in Horticulture.

102. **Principles of Horticulture.** Four credit hours. Second semester. Four year course in Horticulture. A continuation of Course 101.

103. **Olericulture or Vegetable Gardening.** Three credit hours. First semester. Four year course in Horticulture.

104. **Olericulture or Vegetable Gardening.** Three credit hours. Second semester. Four year course in Horticulture. A continuation of Course 103.

105. **Pomology.** Four credit hours. First semester. Four year course in Horticulture.

106. **Pomology.** Four credit hours. Second semester. Four year course in Horticulture. A continuation of Course 105.

107. **Plant Variation.** Three credit hours. First semester. Four year course in Horticulture.

108. **Landscape Gardening.** Three credit hours. Second semester. Two and four year courses in Horticulture.

109. **Experimental Horticulture.** Three credit hours. First semester. Four year course in Horticulture.

110. **Experimental Horticulture.** Three credit hours. Second semester. Four year course in Horticulture. A continuation of Course 109.

111. **Principles of Horticulture.** Four credit hours. First semester. Two year course in Horticulture and Agriculture.

112. **Principles of Horticulture.** Four credit hours. Second semester. Two year courses in Horticulture and Agriculture. A continuation of Course 111.

113. **Pomology.** Four credit hours. First semester. Two year course in Horticulture.

This course is essentially the same as Courses 105 and 106, modified and adapted to the needs of the two-year students.

114. **Pomology.** Four credit hours. Second semester. Two year course in Horticulture. A continuation of Course 113.

115. **Olericulture or Vegetable Gardening.** Four credit hours. First semester. Two year course in Horticulture.

This course is essentially the same as Courses 103 and 104, modified and adapted to the needs of the two year students.

116. **Olericulture or Vegetable Gardening.** Four credit hours. Second semester. Two year course in Horticulture. A continuation of Course 115.

118. **Pomology.** Four credit hours. Second semester. Four year course in Agriculture.

119. **Floriculture.** Three credit hours. Second semester. Four year course in Horticulture.

INDUSTRIAL ARTS

(Office, Room 2, Hayes Hall)

PROFESSOR SANBORN, ASSOCIATE PROFESSOR KNIGHT, MR. CROWE,
MR. CASE, MR. BEEM, MR. DENMAN

INDUSTRIAL ARTS

101. **Tools and Machines.** Three credit hours. Three recitations weekly. Short Industrial Arts, second year, first semester, Prerequisite, Mathematics 114 or 132, Concurrent Physics 101.

102. Continuation of 101. Three credit hours. Three recitations weekly. Short Industrial Arts, second year, second semester.

103. **Designing.** Two credit hours. Two three-hour laboratory periods weekly. Short Industrial Arts, second year, first semester. Concurrent, Industrial Arts 101.

104. Continuation of 103. Two credit hours. Two three-hour laboratory periods weekly. Short Industrial Arts, second year, second semester. Concurrent, Industrial Arts 102.

110. **Strength of Materials.** Six credit hours. Five recitations and one three-hour laboratory period weekly. Short Industrial Arts, second year, second semester.

112. **Machine Design.** Two credit hours. Two two-hour drawing periods weekly. Electrical Engineering, fourth year, second semester. Prerequisite, Mechanics 102, and Engineering Drawing 111.

114. **Shop Building.** Two credit hours. Two recitations weekly. Alternative with Mechanical Engineering 146, fourth year, second semester. Prerequisite, Civil Engineering 126.

SHOPWORK

101 or 102. **Carpentry and Pattern Making.**

103 or 104. **Forging.**

105. **Foundry Work.** One and two-thirds credit hours. One recitation and one three-hour laboratory weekly. Mechanical Engineering, second year, first semester.

106. Repetition of 105. Short Industrial Arts, first year, second semester.

107. **Chipping and Filing.** One and one-third credit hours. Two two-hour laboratory periods weekly. Mechanical Engineering, second year, first semester. Ceramic Engineering, alternative with Courses 109 and 115.

108. Repetition of 107. Short Industrial Arts, first year, second semester.

109. **Joinery and Pattern Making.** Two credit hours. One recitation and two two-hour laboratory periods weekly. Short Industrial Arts, first year, first semester. Ceramic Engineering, Short Clay-working, alternative with Shopwork 107 and 115; Chemical Engineering, Electrical Engineering, Mechanical Engineering, and Mine Engineering during the Summer Session at the close of the first year.

110. Repetition of 109.

111. **Advanced Pattern-Making.** Two credit hours. One recitation and two two-hour laboratory periods weekly. Mechanical Engineering, second year, first semester. Prerequisite, Shopwork 109.

112. Repetition of 111. Short Industrial Arts, first year, second semester.

113. **Cabinet-Making.** Two credit hours. Two three-hour laboratory periods weekly. Elective, first semester. Prerequisite, Shopwork 109 or 110.

114. Repetition of 113. Elective, second semester.

115. **Forging.** Two credit hours. One recitation and two two-hour laboratory periods weekly. Short Industrial Arts, second year, first semester. Ceramic, Chemical, Electrical, Mechanical, and Mine Engineering, and Short Clay-Working, during the summer session at the close of first year.

116. Repetition of 115. Short Mining, first year, second semester.

118. **Advanced Forging.** Two credit hours. Two three-hour laboratory periods weekly. Elective, second semester. Prerequisite, Shopwork 115.

119. **Machine Work.** Three credit hours. One recitation and two three-hour laboratory periods weekly. Electrical Engineering and Short Industrial Arts, second year, first semester.

120. Repetition of 119. Mechanical Engineering, second year, second semester.

121. **Advanced Machine Work.** Three credit hours. One recitation and two three-hour laboratory periods weekly. Mechanical Engineering, third year, first semester. Prerequisite, Shopwork 119 or 120.

122. Repetition of 121. Short Industrial Arts and Electrical Engineering, second year, second semester.

123. **Advanced Machine Work.** Two credit hours. Two three-hour laboratory periods weekly. Elective, first semester. Prerequisite, Shopwork 121 or 122.

125. **Construction Work.** Two credit hours. First semester. Two three-hour laboratory periods weekly. Elective. Prerequisite, Shopwork 121 or 122.

126. Repetition of 125. Second semester. Elective.

127. **Tool-making and Jig Work.** Three credit hours. First semester. Elective. Prerequisite, Shopwork 123.

128. Repetition of 127. Three credit hours. Elective, second semester.

129-130. Wood Turning and Pattern Making. Three credit hours. Prerequisite, Shopwork 109. Option, course in Manual Training, third year.

131-132. Advanced Cabinet Work. Three credit hours. Prerequisite, Shopwork 114. Option, course in Manual Training, fourth year.

GRADUATE WORK

201-202. Research Work. Five to ten credit hours. The year. Library, conference and laboratory work. Time to be arranged with the instructor. Prerequisite, Physics 113, 114; Mechanics 101, 102; and Mechanical Engineering 127, 144, or Metallurgy 109, 110, and the permission of the instructor in charge.

Research work with special reference to the application of Physics, Chemistry, Metallurgy and Machine Design to the problems of the metal-working industries. This work is under the supervision of Professor Sanborn and Associate Professor Knight.

SUMMER SESSION

The courses in Shopwork during the Summer Session continue for four weeks. The courses open to students are 107, 109, 111, 115, 119, 121 and 129. Each course requires attendance six days a week. Students electing Electrical Engineering, Mechanical Engineering, Mine Engineering, are required to take Shopwork 109 and 115 at the close of the first year. Students electing Chemical Engineering are required to take Shopwork 109 and 115 during the Summer Session at the close of the first year or second year.

Students in Industrial Arts are required to take Shopwork 107 and 109 at the close of the first year, and students electing Ceramic Engineering (both long and short courses) are required to take two of the three following subjects at the close of the first year: Shopwork 107, 109, and 115.

ITALIAN

(See Romance Languages)

LATIN LANGUAGE AND LITERATURE

(Office, Room 307, University Hall)

PROFESSORS DERBY, HODGMAN, AND ELDEN

101. Cicero: De Senectute and De Amicitia; Horace: Odes. Four credit hours. First semester. Prerequisite, four units of preparatory Latin.

102. Horace: Odes, or Ovid: Metamorphoses; Livy or Sallust, or Prose Composition. Four credit hours. Second semester. Prerequisite, Course 101.

103. Pliny or Cicero: Selected Letters; CATULLUS or TACITUS. Three credit hours. First semester. Prerequisite, Course 101-102.

104. Latin Comedy: PLAUTUS and TERENCE, three plays, Three credit hours. Second semester. Prerequisite, Course 103.

105. Roman Satire: HORACE, JUVENAL and PERSIUS. Two credit hours. First semester. Prerequisite, Courses 101-104.

106. The Roman Novel: PETRONIUS; SENECA: Selections. Two credit hours. Second semester: Prerequisite, Courses 101-104.

Courses 105 and 106 are important for Juniors and Seniors.

107-108. Roman Private Life. One credit hour. The year. Prerequisite, Course 101-102.

109-110. Quiz and Review. One credit hour. The year.

111-112. Roman and Comparative Literature. One credit hour. The year.

113-114. Pro-Seminar. Three credit hours. The year.

115-116. Latin Prose Composition. Three credit hours. The year.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Before entering upon graduate work in this department, the student should have had, in addition to the usual preparatory course of four years, not less than three years of collegiate study of Latin.

The plan of study for the second degree (A. M.) with Latin as the major or minor subject, should not include more than one of the courses 107-116; as a rule, these courses should be taken by undergraduates.

The ability to use French or German works of reference, a good knowledge of ancient history and of English literature will be found especially useful. Greek 115-116 (Greek Art), and Greek 117-118 (Mediæval Art), are recommended.

Students of Latin philology will find German 139 (Gothic) valuable.

Lines of reading and of investigation, supplementary to the regular graduate courses and necessary to a symmetrical knowledge of the language, literature, and life of the Roman people, will be required according to the needs of the individual students.

123-124. Historical Latin Grammar: Sounds and Inflections. One credit hour. The year. Prerequisite, Courses 101-104.

125-126. Historical Latin Grammar: Syntax. One credit hour. The year. Prerequisite, Courses 101-104.

Courses 123-126 are deemed essential for those who make Latin a major or minor subject of study in graduate work, and are recommended for advanced undergraduate study.

119-120. Advanced Latin Composition. One or two credit hours. The year. Prerequisite, Course 115-116.

121. Roman Prose Authors. Cicero, Seneca, Quintilian, Suetonius, or Tacitus. Two to five credit hours. First semester.

122. Roman Poets. Plautus, Terence, Lucretius, Vergil, Ovid, Lucan, Statius, Martial, or Silius Italicus. Two to five credit hours. Second semester.

Courses 121-122 are designed to give an opportunity to read a considerable portion of the author chosen, and are open to advanced students only.

GRADUATE WORK

201-202. Roman Religion. One credit hour. The year.

***203-204. Latin Literature.** One credit hour. The year.

***207-208. Seminar.** Two credit hours. The year.

***211-212. Latin Philology.** One credit hour. The year.

213-214. Elements of Epigraphy and Paleography. Two or three credit hours. The year.

215-216. Roman Antiquities and Archaeology. One to three credit hours. The year.

LAW

(Office, Page Hall)

PROFESSORS ADAMS, PAGE, RIGHTMIRE, TUTTLE, SCHAUCK, KINKEAD, DILLON, ASSISTANT PROFESSORS COCKLEY AND BLANCHARD

For a detailed description of the courses of study offered in the College of Law, the reader is referred to page 36 and following.

MANUAL TRAINING

(Office, Room 21, Hayes Hall)

ASSISTANT PROFESSOR LEWIS

102. Handwork for Supervisors. Two credit hours. Second semester.

A review of the principles and methods involved in paper work, cardboard, weaving, basketry, clay modeling, and elementary book binding.

103. Constructive Design. Three credit hours. First semester.

Lectures and practical problems of construction, and design of projects in wood working and cabinet work. Suggestions for problems to be used in teaching. General principles of proportion, spacing, use and style in furniture. Theory of furniture construction.

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* Not given in 1912-1913.

104. **Clay Modeling.** Three credit hours. Second semester.

This course deals with the principles involved in the study of form, as applied to modeling in the round, and to reproducing form in high or low relief from flowers, animals, etc. The problems are planned for school work.

105. **Pottery.** Three credit hours. First semester.

The practical problems involved in pottery are considered in this work, and the instruction given covers the general requirements for teaching the subject in the schools. Pottery is made by hand, wheel, and casting processes.

106. **Pottery.** Three credit hours. Second semester. Continuation of 105.

107. **Sheet Metal Work.** Two credit hours. First semester.

This course includes instruction and practise in the use of sheet metals. The problems consist of cabinet fittings, drawer pulls, escutcheons, trays, bowls, etc. The processes involved include raising, hammering, chasing, hard and soft soldering, bending, sawing, coloring, and enameling.

108. **Sheet Metal Work.** Two credit hours. Second semester. Continuation of 107.

111. **Teaching of Manual Training.** Three credit hours. First semester.

A course of lectures in which the following are considered: History of Manual Training, correlation with other subjects; subject matter for manual training courses and methods of teaching.

112. **Materials, Methods, and Equipment.** Three credit hours. Second semester.

Lectures on equipment and supplies; instruction in the technical processes of wood working and finishing as a basis of instruction in the schools. The properties of wood, and application to construction. Use and care of tools in the class room.

115. **Leather Work.** Three credit hours. First semester.

This course includes instruction in leather work and the practical methods employed in the industry are used, as stitching, coloring, covering, tooling and pressing.

116. **Wood Carving.** Three credit hours. Second Semester.

Laboratory work. The work is confined to the design and practise of wood carving. Original relief designs are made and applied to trays, picture frames, book ends, chests, etc.

MATHEMATICS

(Office, Room 314 University Hall)

PROFESSORS BOHANNAN, MCCOARD, SWARTZEL, KUHN, ASSOCIATE PROFESSORS ARNOLD, RASOR, ASSISTANT PROFESSORS BAREIS, MORRIS, PRESTON, WEST, MISS RICKARD, MR. HEBBERT

101. **Elementary Algebra.** Five credit hours. Five recitations weekly. Short Clay-working, Short Industrial Arts, and Short Mining, first year, first semester. Text-book: Wentworth's Algebra.

102. Continuation of 101. Five credit hours. Five recitations weekly. Short Clay-working, Short Industrial Arts, and Short Mining, first year, second semester. Prerequisite, Course 101.

103. **Elementary Algebra.** Five credit hours. First semester.

104. **Plane Geometry.** Five credit hours. Second semester.

113. **Plane and Solid Geometry.** Five credit hours. Five recitations weekly. Short Clay-working, Short Industrial Arts, and Short Mining, first year, first semester. Text-book: Venable's Geometry.

114. **Solid Geometry and Plane Trigonometry.** Five credit hours. Five recitations weekly. Short Clay-working, Short Industrial Arts, and Short Mining, first year, second semester. Prerequisite, Course 113. Text-books: Venable's Geometry, and Bohannan's Trigonometry.

121. **Trigonometry and College Algebra.** Three credit hours. First semester.

122. **Analytical Geometry and College Algebra.** Three credit hours. Second semester.

*125-126. **History of Elementary Mathematics.** Two credit hours. The year.

127-128. **Calculus.** Three credit hours. The year. Prerequisite, Courses 121 and 122.

129-130. **Mathematics of Statistics, Finance and Insurance.** Three credit hours. The year. Prerequisite, Course 122.

131. **Trigonometry and College Algebra.** Five credit hours. First semester.

132. **College Algebra and Analytical Geometry.** Five credit hours. Second semester.

141-142. **Calculus.** Five credit hours. The year. Prerequisite, Mathematics 121, 122, or 131, 132.

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*Not given in 1912-1913.

151. Differential Equations. One credit hour. One recitation weekly. Mechanical Engineering, third year, first semester. Prerequisite, Course 141-142. Text-book: Boyd's Differential Equations.

161. Determinants. Three credit hours. First semester.

162. Theory of Equations. Three credit hours. Second semester.

163-164. Plane and Solid Analytical Geometry. Three credit hours. The year.

165-166. Advanced Calculus. Three credit hours. The year.

167-168. Differential Equations. Three credit hours. The year.

169. Differential Equations. Two credit hours. Two recitations weekly. Elective, first semester. Prerequisite, Mathematics 142. Text-book: Boyd's Differential Equations.

171. Projective Geometry. Three credit hours. First semester.

172. Non-Euclidian Geometry. Three credit hours. Second semester.

173. Modern Higher Algebra. Three credit hours. First semester.

174. The Galois Theory of Equations. Three credit hours. Second semester.

175-176. The Teaching of Mathematics. Two credit hours. The year.

GRADUATE WORK

201-202. Research Work.

(a) Infinite Series and Products. Associate Professor ARNOLD.
(b) Theory of Functions of a Real Variable. Associate Professor RASOR.
(c) Calculus of Variations. Professor BOHANNAN.
(d) Theory of Functions of a Complex Variable. Associate Professor RASOR.
(e) Elliptic Functions. Assistant Professor WEST.
(f) Potential Functions. Professor SWARTZEL.
(g) Fourier's Series and Spherical Harmonics. Professor SWARTZEL.
(h) Groups. Professor KUHN.
(i) Theory of Numbers. Assistant Professor MORRIS.
(j) Higher Plane Curves. Professor McCOARD.
(k) Invariants. Professor KUHN.
(l) Differential Geometry. Professor BOHANNAN.
(m) The Mathematical Theory of Electricity and Magnetism. Professor BOHANNAN.
(p) The History of Mathematics. Associate Professor ARNOLD.
(q) Theory of Statistics. Assistant Professor WEST.

MECHANICAL ENGINEERING

(Office, Room 244, Engineering Laboratory)

PROFESSORS MAGRUDER AND HITCHCOCK, ASSOCIATE PROFESSOR JUDD, ASSISTANT PROFESSOR VALLANCE MR. MCCLELLAND, MR. HOPKINS.

101. **Mechanism.** Three credit hours. Three recitations weekly. Electrical Engineering, third year, first semester. Prerequisites Engineering Drawing 103 and Physics 114.

103. **Steam Power Plants.** Three credit hours. Three recitations weekly. Chemical, Electrical, and Mechanical Engineering, third year, first semester. Prerequisites, Engineering Drawing 104 and Physics 112.

110. **Mechanism and Machine Design.** Three credit hours. Three recitations weekly. Ceramic Engineering, third year, second semester. Prerequisite, Drawing 104, Physics 112 and Mechanics 101.

114. **Mechanism.** Three credit hours. Three recitations weekly. Mechanical Engineering, third year, second semester. Prerequisite, Drawing 104 and Physics 112.

116. **Mechanism Drawing.** One credit hour. One three-hour drawing period weekly. Mechanical Engineering, third year, second semester. Prerequisite or concurrent, Mechanical Engineering 114.

118. **Steam Engines and Boilers.** Three credit hours. Four recitations weekly. Electrical and Mechanical Engineering, third year, second semester. Prerequisites, Mechanical Engineering 103 and Mechanics 101.

120. **Steam Boilers.** One credit hour. One recitation or lecture weekly. Mechanical Engineering, third year, second semester. Prerequisite, Mechanical Engineering 103 and Mechanics 101.

121. **Heating and Ventilating.** Two credit hours. Two recitations weekly. Architecture, fourth year, first semester. Prerequisite, Mechanics 101.

123. **Materials of Construction.** Two credit hours. One recitation and one three-hour laboratory period weekly. Required in Architecture, fourth year, first semester. Prerequisite, Mechanics 101.

125. **Gas Engines and Producers.** Two credit hours. Two recitations weekly. Required in Mechanical Engineering, fourth year, first semester. Prerequisite, Mechanical Engineering 118.

127. **Machine Design.** Five credit hours. Five recitations weekly. Required in Chemical and Mechanical Engineering, fourth year, first semester. Prerequisite, Drawing 104 and 111, Mechanics 102, and Metallurgy 109.

128. **Thermodynamics.** Two credit hours. Two recitations weekly. Required in Mechanical Engineering, fourth year, first semester. Prerequisite, Mechanical Engineering 118.

130. **Inspection Trip to the East.** The seventh week before Commencement, third or fourth years. Required in Mechanical Engineering. Prerequisite, Mechanical Engineering 103.

Includes Pittsburg, Buffalo, Niagara Falls, Cleveland, and possibly other places. The entire expense need not exceed $32. A satisfactory written report upon the work of the trip is required.

132. **Inspection Trip to the West.** The seventh week before Commencement, third or fourth years. Required in Mechanical Engineering. Prerequisite, Mechanical Engineering 103.

Includes Chicago, Milwaukee, Gary, and possibly other places. The entire expense need not exceed $32. A satisfactory written report upon the work of the trip is required.

134. **Written Report.** Course of assigned reading upon processes of manufacture and power plants taken and reported upon by third and fourth year students in Mechanical Engineering as a substitute for Mechanical Engineering 130 on presentation of reasons satisfactory to the head of the department. The seventh week before Commencement, third or fourth years. Required in Mechanical Engineering.

136. **Written Report.** Similar to Mechanical Engineering 134, as a substitute for Mechanical Engineering 132. The seventh week before Commencement, third or fourth years. Required in Mechanical Engineering.

140. **Mechanism and Machine Design.** Two credit hours. Two recitations weekly. Required in Civil Engineering, fourth year, second semester. Prerequisite, Mechanics 102.

142. **Hydraulic Machinery.** Two credit hours. Two recitations weekly. Required in Mechanical Engineering, fourth year, second semester. Prerequisite, Mechanics 102, and Mechanical Engineering 106.

144. **Machine Design.** Five credit hours. Three recitations and two three-hour drawing periods weekly. Required in Chemical and Mechanical Engineering, fourth year, second semester. Prerequisite, Mechanical Engineering 127.

146. **Steam Turbines.** Two credit hours. Two recitations weekly. Optional in Mechanical Engineering with Industrial Arts

114, fourth year, second semester. Prerequisite, Mechanical Engineering 129.

148. **Thesis Work.** Three credit hours. Required in Mechanical Engineering, fourth year, second semester. Prerequisite, Mechanical Engineering 125, 127 or 129.

160. **Experimental Engineering Laboratory.** Two credit hours. One four-hour laboratory period weekly. Required in Electrial Engineering, third year, second semester. Concurrent, Mechanics 102, and Mechanical Engineering 118.

164. **Experimental Engineering Laboratory.** Two credit hours. One four-hour laboratory period weekly. Required in Mechanical Engineering, third year, second semester. Concurrent, Mechanics 102, and Mechanical Engineering 118.

171. **Experimental Engineering Laboratory.** Four credit hours. Two recitations weekly and one four-hour laboratory period weekly. Required in Ceramic Engineering, fourth year, first semester, Prerequisites, Mechanics 102, and Metallurgy 109.

173. **Experimental Engineering Laboratory.** Five credit hours. One recitation weekly and two four-hour laboratory periods weekly. Required in Civil Engineering, fourth year, first semester. Prerequisite, Mechanics 102.

175. **Experimental Engineering Laboratory.** Three credit hours. One six-hour laboratory period weekly. Required in Electrical Engineering, fourth year, first semester. Prerequisite, Mechanical Engineering 118 and 160.

179. **Experimental Engineering Laboratory.** Two credit hours. One four-hour laboratory period weekly. Required in Mechanical Engineering, fourth year, first semester. Prerequisite, Mechanical Engineering, 164. Concurrent, Mechanical Engineering 125 and 129.

190. **Experimental Engineering Laboratory.** Six credit hours. Four three-hour laboratory periods weekly. Required in Mechanical Engineering, fourth year, second semester. Prerequisites, Mechanical Engineering 125, 129 and 179.

192. **Experimental Engineering Laboratory.** Three credit hours. One recitation weekly and one four-hour laboratory period weekly. Required in Mine Engineering, fourth year, second semester. Prerequisites, Mechanics 102, and Metallurgy 109.

GRADUATE WORK

201-202. **Research Work.** Five to ten credit hours. The year. Library, Conference and Laboratory work. Time arranged with the instructor. Prerequisite, the permission of the instructor in charge.

Research work in gas enginry is conducted under the supervision of Professor Magruder; in steam enginry and fuel testing, under Professor Hitchcock; in applied hydraulics, under Associate Professor Judd.

MECHANICS

(Office, Room 233, Mines Building)

PROFESSOR J. E. BOYD, ASSOCIATE PROFESSOR CODDINGTON, MR. PERRY

101. **Statics and Strength of Materials.** Five credit hours. Architecture, Ceramic, Chemical, Civil, Electrical, Mechanical and Mine Engineering, third year, first semester. Prerequisite, Mathematics 142.

102. **Strength of Materials,** Continued. Kinetics and Hydraulics. Five credit hours. Chemical, Civil, Electrical, Mechanical and Mine Engineering, third year, second semester. Prerequisite, Mechanics 101.

104. **Strength of Materials.** Two credit hours. Architecture and Ceramic Engineering, third year, second semester. Prerequisite, Mechanics 101.

105-106. **Advanced Theoretical Mechanics.** Three credit hours. The year. For graduates and advanced undergraduates. Prerequisite, Mechanics 102 and Differential Equations.

GRADUATE WORK

201-202. **Advanced Theoretical Mechanics.** Three credit hours. The year.

Library and Conference work. Time to be arranged with the instructor. Prerequisite, Mechanics 101-102, and the permission of the instructor in charge. This work is done under the supervision of Professor Boyd and Associate Professor Coddington.

METALLURGY AND MINERALOGY

(Office, Room 100, Mines Building)

PROFESSOR SOMERMEIER, ASSISTANT PROFESSORS DEMOREST AND McCAUGHEY

102. **Mineral Chemistry.** Four credit hours. Short Mining second year, second semester. Prerequisite, Chemistry 101.

104. **Crystallography and Mineralogy.** Three credit hours. Mine Engineering, second year, and Chemical Engineering, third year, second semester. Prerequisite, Chemistry 106.

105. **Fire Assaying.** Three credit hours. Mine Engineering, third year, first semester. Laboratory, two afternoons per week. Prerequisite, Metallurgy 106, or equivalent.

106. **Metallurgical Analysis.** Four credit hours. Mine Engineering, second year, second semester. Prerequisite, Chemistry 106 or 110, and Chemistry 119.

107. **Alloy Analysis.** Four credit hours. Mine Engineering, third year, first semester. Prerequisite, Metallurgy 106.

108. **Determinative Mineralogy.** Three credit hours. Two three-hour laboratory periods weekly. Mine Enginering, third year, second semester. Prerequisite, Metallurgy 104.

109. **General Metallurgy.** Four credit hours. Mine Engineering, Mechanical Engineering, Chemical Engineering, third year, first semester; Ceramic Engineering, fourth year, first semester. Prerequisites, Chemistry 106, and Physics 114.

110. **Metallurgy of Non-Ferrous Metals.** Four credit hours. Mine Engineering, third year, second semester.

111. **Metallurgical Construction.** Two credit hours. Mine Engineeering, fourth year, first semester. Prerequisites, Drawing 111, Mechanics 102, Metallurgy 109 and concurrent with 113.

112. **Technical Gas Analysis.** Two credit hours. Mine Engineering, third year, second semester. Prerequisites, Metallurgy 106, 107, 109, and 110, or equivalent.

113. **Ore Dressing and Coal Washing.** Two credit hours. Mine Engineering, fourth year, first semester. Prerequisite, Metallurgy 109.

114. **Special Metallurgy.** Three credit hours. Mine Engineering, fourth year, second semester. Prerequisites, Metallurgy 106, 107, 109, 110, or equivalent.

116. **Thesis.** Three credit hours. Second semester.

117. **Advanced Crystallography and Physical Mineralogy.** Three credit hours. First semester. Two lectures and one laboratory period.

The study of the geometrical and physical properties of crystals. Laboratory work on the measurement, calculation and projection of crystals and the determination of physical and optical constants of crystallized bodies. Prerequisites, Physics and Chemistry.

118. **Microscopic Mineralogy.** Three credit hours. Second semester. One lecture and two laboratory periods.

The use of the polarizing microscope in the indentification of minerals in fine powder and in thin section. Determination of the optical constants of minerals and crystalized bodies with a polarizing microscope. Prerequisite, Metallurgy 104, Physics and Chemistry.

GRADUATE WORK

201. **Research Work.** Three to five credit hours. First semester. Library, Conference and Laboratory work. Time arranged with the instructor. Prerequisite, the permission of the instructor in charge.

These courses are under the supervision of Professor Somermeier and Assistant Professor Demorest.

METEOROLOGY

(Townshend Hall)

PROFESSOR J. WARREN SMITH

101. **Elementary Meteorology.** Two credit hours. First semester. Textbook, Moore's Descriptive Meteorology.

The ordinary meteorological instruments used by the United States Weather Bureau will be in use and instruction will be given in handling them. The daily weather maps will be studied and the method of making them taught.

102. **Climatology, Practical Meteorology, Phenology.** Two credit hours. Second semester. Prerequisite, course 101 or Geology 162.

Special attention will be given to the climate of the United States and of Ohio, the relation of climate to man, the practical benefits to be derived from the daily weather forecasts and warnings, and the effect of weather upon business, manufacturing, health, crime, deportment, and crop yield.

MILITARY SCIENCE AND TACTICS

(The Armory)

CAPTAIN GEORGE L. CONVERSE, U. S. A., RETIRED

The Military Department is open five days during each week Required of all students first and second years (except Law) unless excused by the Military and Gymnasium Board.

1. **Military Drill.** One credit hour. Five months, three hours per week (divided between fall and spring) military drill; four months, three hours per week,(winter) of class-room instruction in drill regulations. Target practise at any open hour during the afternoons of the winter months, at 100, 200 and 300 yards. Lecture, one hour weekly, by the President, upon topics of common interest to the student body.

2. **Military Drill.** One credit hour. Five months, three hours per week, (divided between fall and spring), in extended order and

guard duty. Four months, three hours per week (winter) of classroom instruction in Articles of War, guard manual and field service regulations. Target practise, at any open hour of the afternoons of the winter months, at 500, 600 and 800 yards.

MINE ENGINEERING

(Office, Room 200, Mines Building)

PROFESSOR RAY, ASSISTANT PROFESSOR MINOR

101. **Mine Engineering.** Five credit hours. Lectures and field practise. Short Mining, second year, first semester. Prerequisite, Mathematics 114.

102. **Mine Engineering.** Five credit hours. Short Mining second year, second semester. Prerequisite, Mine Engineering 101 and Physics 101.

103. **Mine Surveying.** Four credit hours. Mine Engineering second year, first semester, and Ceramic Engineering, third year, first semester. Prerequisites, Engineering Drawing 104, and Mathematics 132.

104. **Plans and Specifications.** Four credit hours. Mine Engineering, fourth year, second semester. Prerequisites, Metallurgy 111, and Mine Engineering 105.

Practise in designing mine plans, drafting and estimating.

105. **Mine Engineering.** Five credit hours. Mine Engineering, fourth year, first semester. Prerequisites, Mechanics 102, Mine Engineering 103, and Geology 165.

106. **Mine Engineering.** Five credit hours. Five lectures weekly. Mine Engineering, fourth year, second semester. Prerequisite, Mine Engineering 105.

A continuation of Mine Engineering 105.

107. **Mine Engineering.** Two credit hours. Two two-hour drawing periods weekly. Short Mining, second year, first semester.

109. **Mine Trip.** One credit hour. First semester.

110. **Mine Trip.** One credit hour. Second semester.

116. **Thesis.** Three credit hours. Second semester.

GRADUATE WORK

201-202. **Research Work.** Three to five credit hours. The year. Library, conference, laboratory and field work. Time arranged with the instructor. Prerequisite, the permission of the instructor in charge.

Mine accidents; preventive regulations; statutory provisions; mine fires; mine explosions; gas indicators; rescue operations; rescue appliances.

PHARMACY

(Rooms 105, 106, 107, 108, Chemistry Hall)

PROFESSOR KAUFFMAN, PROFESSOR DYE, MR. SPEASE.

101. **Theory and Practise of Pharmacy.** Five credit hours. First semester. Lectures, recitations, and laboratory.

102. **Operative Pharmacy.** A study of galenical preparations. Five credit hours. Second semester. Lectures, recitations and laboratory.

103. **Pharmaceutical Chemistry.** Five credit hours. First semester. Second year. Lectures, recitations and laboratory.

A study of medicinal preparations involving chemical reactions.

104. **Extemporaneous Pharmacy and Prescription Practise.** Six credit hours. Second semester. Lectures, recitations, and laboratory.

105. **Materia Medica.** Three credit hours. First semester. Lectures and recitations.

106. **Materia Medica.** Three credit hours. Second semester. Lectures and recitations.

107. **Pharmaceutical Assaying.** Five credit hours. First semester. Lectures, recitations, and laboratory.

A study of the assay process of the pharmacopoea.

108. **Pharmaceutical Analysis.** Five credit hours. Second semester. Lectures, recitations, and laboratory.

Methods for the examination of drugs and medicinal preparations.

109. **Pharmacognosy.** Three credit hours. First semester. Lectures, recitations, and laboratory.

A study of plant cells and their modification and content.

110. **Pharmacognosy.** Three credit hours. Second semester. Lectures, recitations, and laboratory.

A microscopical study of crude drugs and spices and their adulterations.

111. **Pharmacognosy.** Three credit hours. First semester. Required of four-year students. Lectures, recitations, and laboratory.

A microscopical study of foods, drugs and spices and their adulterants.

112. **Pharmacognosy.** A continuation of course 111. Three credit hours. Second semester. Required of four-year students. Lectures, recitations, and laboratory.

Special work on textile fibers, micro-chemical tests, etc.

113. **Pharmaceutical Problems.** One credit hour. First semester. Lectures and practical exercises.

114. **Toxicology.** Three credit hours. Second semester. Lectures and recitations.

116. **Preparation and Application of Physiological and Pathological Reagents.** Two credit hours. Second semester. Lectures, recitations and laboratory work.

117-118. **Pharmaceutical Latin.** Four credit hours. The year.

PHILOSOPHY

(Office, Room 321, University Hall)

PROFESSOR LEIGHTON, PROFESSOR DAVIES

101. **Introduction to Philosophy.** Three credit hours. First semester. Open to first year students.

The meaning and scope of philosophy, its typical problems, its relations to the special sciences, morality, art, the state, and religion.

102. **Introductory Logic.** Three credit hours. Second semester. Open to first year students.

A practise course in the methods of correct thinking.

103. **Introductory Logic.** Three credit hours. First semester.

105-106. **Elementary Ethics.** Three credit hours. The year. Not open to first year students.

This course is an introduction to the study of the moral life as it appears in the individual and in society.

111-112. **Advanced Ethics.** Two credit hours. The year. Prerequisite, one year in philosophy, psychology, or sociology.

A course in the origin and development of morality, in the light of our more recent knowledge in anthropology, sociology, and psychology. Text: Davies, The Moral Life; A study in Genetic Ethics.

113-114 **Advanced Logic.** Three credit hours. The year. Prerequisite, Philosophy 102 or 103.

A systematic study of the conditions, criteria, nature and degrees of truth.

115-116. **Aesthetics.** Two credit hours. The year. Open to first year students.

An elementary study of the beautiful in nature and in art.

*119. **Philosophy of Religion.** Three credit hours. First semester. Prerequisite one year's work in Philosophy or Psychology.

An account of the actual nature of religion, as shown in its chief historical and psychological phenomena, and an interpretation of its significance for culture and the truth of its leading conceptions.

121-122. **Metaphysics.** Two credit hours. The year. Prerequisite, at least one year's work in Philosophy and in a natural science.

This course is a systematic discussion of the fundamental problems of theoretical philosophy; the meaning of truth and its relation to reality, the philosophy of nature, and of the human self, the problems of freedom, evil, immortality, and theism.

127. **British Philosophy from Bacon to Hume.** Two credit hours. First semester. Prerequisite, one year in Philosophy or Psychology.

An historical course, covering the period of British Empiricism.

128. **Continental Philosophy from Descartes to Leibnitz.** Two credit hours. Second semester. Prerequisite, one year in Philosophy.

An historical course, covering the period of continental rationalism.

129-130. **The Humanistic Movement.** Three credit hours. The year. Prerequisite, one year in Philosophy or Psychology.

Traces the problem of man in the history of culture, and studies the meaning of this problem for a philospohy of life.

*131-132. **Philosophy of Values.** Three credit hours. The year. Prerequisite, one year in Philosopy, Psychology, or Economics and Sociology.

A study of the foundations of our economic, social, ethical, æsthetical, and religious judgments, and the nature of the objects of these judgments.

137. **The Philosophy of Kant.** Two credit hours. First semester. Prerequisite, two years' work including Philosophy, 151-152.

A study of the system of Kant in its historical relations and present significance.

138. **The Philosophy of Hegel.** Two credit hours. Second semester. Prerequisite, the same as for course 137, which should precede this course.

A study of Hegel's system in its historical relations, with an estimate of its present value.

142. **The Main Currents of Nineteenth Century Thought.** Two credit hours. Second semester. Not open to first or second year students.

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*Not given in 1912-1913.

A non-technical account and estimate of the chief formative influences in the reflective life of the nineteenth century. Intended for students of literature, science, and social movements. Does not presuppose any previous philosophical training.

151-152. **History of Philosophy.** Three credit hours. The year. Not open to first year students.

In this course the history of reflective thinking on the problems of human life and the world-order will be traced in outline, from the dawn of Greek speculation to the rise of the modern doctrine of evolution. Constant regard will be had to the relation of philosophy to social, literary, and scientific movements.

*155-156. **History of Christian Philosophy.** Three credit hours. The year. Open to first year students.

A study of the source material in the New Testament and of the stages through which this material was developed into the scholastic systems of the Middle Ages.

GRADUATE WORK

201-202. **Graduate Seminar.** Two to five credit hours. The year. Opportunities for research, depending on the previous training and special interests of individual students, will be afforded in (a) The History of Philosophy, (b) Logic and the Theory of the Sciences, (c) Metaphysics, (d) Ethics, and (e) The Philosophy of Religion.

*205-206. **The Philosophy of Mind.** Two credit hours. The year. Prerequisite, one year's work in Philosophy and Psychology.

A study of the problems growing out of the nature of mind and its place in history and the material universe.

*207-208. **Contemporary Philosophical Issues.** Two to three credit hours. The year. Prerequisite, two years in Philosophy and Psychology, including either Philosophy 151-152, 127-128, or 137-138.

An expository and critical discussion of recent pragmatism, humanism, realism, pluralism, and personal idealism.

PHYSICAL EDUCATION

DR. H. S. WINGERT, DIRECTOR

Required Courses

(A) For Men

(The Gymnasium)

PROFESSOR WINGERT, MR. BAUER, MR. ALEXANDER

1. **Physical Education.** One credit hour. Two hours per week. The year. Required of all first-year students. This course

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*Not given in 1912-1913.

consist of (a) Lectures on hygiene and physiology of exercise first two weeks, first semester, (b) Corrective: A graded course of freehand exercise, stretching, relaxing, stimulating, exercise with light hand apparatus for the relief and correction of slight body defects, deformities, improper carriage, etc. (c) Educative: Graded progressive exercise on the apparatus and mats to promote muscular tone, vigor, vitality, endurance. (d) Recreative: Gymnasium games, mental relaxation, non-competitive exercises.

A thorough physical examination is made of each student at the opening and close of the college year. Physical defects, abnormalities, and weaknesses are noted, and judicious, healthful exercise is prescribed to fit the student's individual needs.

2. **Advanced Exercises.** Elective. (a) Advanced exercises on the apparatus and mats. (b) Combative exercises—boxing, fencing, wrestling. A small charge is made to those electing this work. (c) Recreative—football, baseball, basketball, tennis, track and field sport, cross-country running, etc. (d) Swimming—an excellent pool is provided for this exercise. Special hours are arranged for those electing the above exercises and credit given in regular course.

(B) For Women

(The Gymnasium)

DR. LITTLEJOHN, MISS SAUER

1. **Physical Education.** One credit hour. Four hours per week during the first year of a student's residence. (a) Lectures on hygiene and purpose of different kinds of physical exercise, four hours per week first two weeks of first semester, first week second semester. (b) Practical work in gymnasium, as follows: (1) Corrective work; exercises for correction of faulty position of different parts of body, and of deformities; for development of chest, etc. (2) Educative work: exercises to develop co-ordination of groups of muscles, accuracy of movement, and to impart grace and beauty and a ready expression of thought in physical motions. (3) Recreative: classic dancing, and rhythmic movements, gymnastic games, and relaxing exercises. (4) Athletics (elective): carefully supervised basketball, running, swimming, etc., for those who desire it. A physical examination is made by the directors of every woman entering this course before she can begin the gymnasium work, and, if necessary, special work will be prescribed to meet her physical needs. A second examination is made at the close of each college year.

2. **Physical Education.** One credit hour. The year. Four hours per week during the second year of a student's residence.

PHYSICS

(Office, Room 24, Physics Hall)

PROFESSOR COLE, ASSOCIATE PROFESSOR EARHART, ASSISTANT PROFESSORS BLAKE, SHEARD, BARNETT AND SMITH

101. Elementary Physics. Six credit hours. Five recitations and lectures, one three-hour laboratory period weekly. Short Clay-working, second year, first semester. Short Mining, first year, first semester. Text-book, Millikin and Gale's Elements of Physics.

103-104. General Physics. Four credit hours. The year. Three recitations and one two-hour laboratory period. Lectures and laboratory. A non-mathematical course for students who have no entrance credit in physics.

105-106. General Physics. Four credit hours. The year. Lectures and Laboratory. Prerequisite, entrance credit in physics.

111. General Physics. Three credit hours. Two lectures, one recitation, and one two-hour laboratory period weekly. Architecture, Chemical, Civil, and Mine Engineering, second year, first semester. Prerequisites, Preparatory Physics and Mathematics 132.

112. Continuation of 111. Three credit hours. Two lectures, one quiz, and one two-hour laboratory period weekly. Chemical, Civil, Mine, and Mechanical Engineering. Prerequisite, Course 111.

113. General Physics. Mechanics and Heat. Five credit hours. Two lectures, three recitations, and one two-hour laboratory period weekly. Ceramic, Electrical, and Mechanical Engineering, second year, first semester. Prerequisites, preparatory Physics and Mathematics 132.

114. General Physics. Electricity, Light and Sound. A continuation of Physics 113. Five credit hours. Two lectures, three reciations, and one two-hour laboratory period weekly. Ceramic, Electrical, second year, second semester. Prerequisite, Course 113.

120. The Teaching of Physics. Two credit hours. Second semester. Prerequisite, one semester of college work in Physics.

121-122. Laboratory. Three to five credit hours. The year. Prerequisite, Course 103-104, or 105-106.

123-124. Advanced Laboratory. Three to five credit hours. The year. Prerequisite, Course 121-122.

127-128. The Theory and Practise of Electrical Measurements. Three to five credit hours. The year. Prerequisites, Course 105-106, or equivalent; a course in electrical measurement, and Mathematics 141-142, or equivalent.

133. **Physical Laboratory.** Two credit hours. Two two-hour laboratory periods weekly. Electrical Engineering, second year, first semester. Concurrent Physics 113.

134. **Physical Laboratory.** Five credit hours. Three three-hour laboratory pereods weekly. Electrial Engineering, second year second semester. Concurrent Physics 114.

135. **Physical Laboratory.** Five credit hours. Three three-hour laboratory periods weekly. Electrical Engineering, third year. first semester. Prerequisite, Physics 114 aud 134.

137. **Physical Laboratory.** Three to five credit hours. Prerequisite or concurrent Physics 111.

138. **Physical Laboratory.** Two credit hours. Two two-hour laboratory periods weekly. Mechanical Engineering, second year, second semester. Prerequisite, Physics 111, Concurrent 112. Elective. Three to five credit hours. Prerequisite, 111 or Concurrent 112.

139. **Physical Laboratory.** Three to five credit hours. A second year's work in Physical Laboratory. Elective, first semester. Prerequisite, Physics 138, or equivalent.

140. **Physical Laboratory.** Three to five credit hours. A continuation of Physics 139. Elective, second semester.

141-142. **Advanced Mechanics and Molecular Physics.** Three credit hours. The year. Prerequisite, Physics 103-104 or 105-106 Calculus precedes or accompanies. First semester, Mechanics, Assistant Professor BLAKE; second semester, Molecular Physics and Heat, Associate Professor EARHART.

This course alternates with 143-144.

*143-144. **Advanced Light and Electricity.** Three credit hours The year. Prerequisite, Physics 103-104 or 105-106; calculus precedes or accompanies. First semester, Light, Assistant Professor SHEARD; second semester, Electricity and Magnetism, Associate Professor EARHART.

This course alternates with 141-142.

Courses 141-142 and 143-144 together constitute a two-year cycle, moderately advanced, covering the whole subject of Physics.

145-146. **Physical Seminar.** One credit hour. The year. Prerequisite, a year of college work in physics. Professor COLE.

169-170. **Theoretical Physics.** An advanced course in Light. Two credit hours. The year. Prerequisite, Physics 105-106, and Mathematics 141-142, or equivalents. Professor COLE.

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*Not given in 1912-1913.

GRADUATE WORK

201-202. Research Laboratory. Three to five hours. The year. Prerequisite, two years of laboratory work in physics.

203-204. Theoretical Mechanics. Three hours. The year. Prerequisite, Physics 105-106, and Mathematics 141-142, or equivalents.

***205-206. Thermodynamics and Electrolytic Conduction.** Two hours. The year. Prerequisite, Physics 105-106, and Mathematics 141-142, or equivalents.

207-208. Theory of Electricity and Magnetism. Three hours The year. Prerequisite, Physics 105-106, and Mathematics 141-142, or equivalents.

Courses 203-204, 205-206, 207-208, and 169-170 together form an advanced two-year cycle, covering the whole ground of physics.

***211-212. Theory of Oscillations with their Applications to Wireless Telegraphy.** Two hours. The year. Prerequisite, Physics 105-106, and Mathematics 141-142, or equivalents. Alternates with 213-214.

213-214. Conduction of Electricity Through Gases and Radioactivity. Two hours. The year. Prerequisite, same as for 211-212.

PHYSIOLOGY

(See Anatomy and Physiology)

POLITICAL ECONOMY

(See Economics and Sociology)

POLITICAL SCIENCE

(Office, Room 200, University Hall)

PROFESSOR SPENCER, ASSISTANT PROFESSOR COKER

101-102. Constitutional Government. Three credit hours. The year. This course must precede all other courses in this department.

102b. Constitutional Government. Three credit hours. Second semester. A repetition of Course 101.

103-104. International Law. Two credit hours. The year.

***106. Municipal Government and Problems.** Three credit hours. Second semester. Given biennially, alternating with course 110.

***107. Party Government.** Three credit hours. First semester Given biennially, alternating with course 109.

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*Not given in 1912-1913.

108. Colonial Government and Administration. Three credit hours. Second semester. Given biennially, alternating with course 114.

109. The Government of Ohio. Three credit hours. First semester. Given biennially, alternating with course 107.

110. Comparative Administration. Three credit hours. Second semester. Given biennially, alternating with course 106.

111-112. Introduction to Jurisprudence. Two credit hours. The year.

***113-114. Problems in International Politics.** One credit hour. The year. Given biennially.

115-116. History of Political Theories. Two credit hours. The year.

117-118. Seminar in Political Science.

119-120. Comparative Constitutional Law. Two credit hours. The year.

PRINCIPLES AND PRACTISE OF EDUCATION

(Office, Old Mechanical Building)

ASSOCIATE PROFESSOR LOWDEN

101. Principles of Education. Three credit hours. First semester.

104. Observation, Criticism, and Practise. Three credit hours. Second semester. Prerequisite, Course 101.

111-112. Advanced Principles of Education. Three credit hours. The year. Prerequisites, Principles and Practise of Education 101 and 104, Psychology 101-102, and History of Education 101-102.

PSYCHOLOGY

(Office, Room 404, University Hall)

PROFESSOR MAJOR, PROFESSOR HAINES

101-102. General Psychology. Introductory course. Three credit hours. The year.

103. Repetition of 102. First semester.

104. Repetition of 101. Second semester.

107-108. Educational Psychology. Two credit hours. The year. Prerequisite, Psychology 101-102, or equivalent.

111-112. Experimental Psychology. Three credit hours. The year. Prerequisite, Psychology 101-102.

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*Not given in 1912-1913.

*115-116. **Mental Development.** Two credit hours. The year.

*119. **Animal Psychology.** Three credit hours. First semester. Prerequisite, Psychology 101-102.

*121. **Abnormal Psychology.** Three credit hours. Second semester. Prerequisite, Psychology 101-102.

*122. **The Defective Child.** Three credit hours. Second semester.

*125. **Social Psychology.** Three credit hours. First semester. Prerequisite, Psychology 101-102.

*126. **Folk Psychology.** Three credit hours. Second semester.

*129-130. **Advanced Psychology.** Two credit hours. The year. Prerequisite, Psychology 101-102.

133-134. **Individual Psychology.** Two credit hours. The year.

137-138. **General Psychology.** Advanced course. Three credit hours. The year.

141-142. **Research in Experimental Psychology.** Two credit hours or more. The year.

145-146. **Seminar in Psychology.** Two to five credit hours. The year.

GRADUATE WORK

This work is open only to advanced students in philosophy, psychology, or education.

201-202. **Graduate Courses in Psychology.** Three to ten hours. The year.

These courses are to meet the needs of individual graduate students who are pursuing a major or minor study in the department of Psychology.

RHETORIC AND ENGLISH LANGUAGE

(See English)

ROMANCE LANGUAGES AND LITERATURES

(Office, University Hall, Room 305)

PROFESSORS BOWEN AND BRUCE, ASSOCIATE PROFESSOR
INGRAHAM, ASSISTANT PROFESSOR HAMILTON,
MR. CHAPIN, MR. ROCKWOOD.

Courses 101, 102, 103, and 104 in French must precede all others (except course 106). Courses 117 to 120 inclusive in French must be preceded by courses 107, 109 and 110, or an equivalent.

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*Not given in 1912-1913.

FOR UNDERGRADUATES

I FRENCH

101-102. Elementary French. Four credit hours. The year. Grammar: Frasers and Squair's, or equivalent. Reader: Aldrich and Foster's, or Bowen's First Scientific. Historical and narrative prose; one or more prose comedies.

103-104. Modern French Literature. Four credit hours. The year. Prerequisite, Course 101-102, or equivalent.

106. Science Reading. Four credit. Second semester. Prerequisite, Course 103.

A course of rapid reading introductory to the vocabulary of scientific literature.

107. Advanced Prose Composition. Two credit hours. First semester.

108. History of French Literature. Two credit hours. Second semester. Lectures and illustrative readings.

109. Seventeenth Century Drama: Moliere and Corneille. Three credit hours. First semester. Given biennially, alternating with Course 111.

110. Seventeenth Century Tragedy and Prose. Three credit hours. Second semester. Given biennially, alternating with Course 112.

***111. Eighteenth Century Drama.** Three credit hours. First semester. Given biennially, alternating with Course 109.

***112. French Society in the Seventeenth Century.** Three credit hours. Second semester. Given biennially, alternating with Course 110.

***113. Recent French Prose.** Two credit hours. First semester. Given biennially, alternating with Course 115. Professor Bruce.

Rapid reading, with lectures. Selections from the works of such writers as Bazin, Daudet, Loti, and Zola.

***114. Practise in Speaking and Writing French.** Two credit hours. Second semester. Students wishing to elect this course must have the consent of the instructor in charge. Given biennially, alternating with Course 116.

***115. Eighteenth Century Prose.** Two credit hours. First semester. Given biennially, alternating with Course 113.

***116. Advanced Conversational Practise.** Two credit hours. Second semester. Students wishing to elect this course must have the consent of the instructor in charge. Given biennially, alternating with Course 114.

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117-118. French Seminar A. Two credit hours. The year. Given biennially, alternating with Course 119-120.

***119-120. French Seminar B.** Two credit hours. The year. Given biennially, alternating with Course 117-118.

II. ITALIAN

***101-102. Elementary Italian.** Two credit hours. The year. Grammar(Grandgent's or Young's) and Reader(Bowen's). Modern prose. Comedies of Goldoni. Students are advised to postpone the election of this course until they have completed French 101-102, or an equivalent.

***103. The Italian Novel.** Two credit hours. First semester. Manzoni (I Promessi Sposi). Lectures. Prerequisite, Italian 101. 102.

***104. Dante.** Two credit hours. Second semester. Selections from The Inferno and Paradiso. Lectures. Prerequisite, Italian 103.

III. SPANISH

101-102. Elementary Spanish. Four credit hours. The year. Grammar(Hills and Ford's), and Ingraham's Victoria y Otros Cuentos. Easy prose and plays. Composition and practise in speaking.

103-104. Modern Spanish Literature. Four credit hours. The year. Prerequisite, Spanish 101-102, or equivalent.

105. Cervantes: Don Quixote. Two credit hours. First semester. Prerequisite, Spanish 103-104.

106. Lope de Vega and Calderon. Two credit hours. Second semester. Prerequisite, Spanish 105.

GRADUATE WORK

201-202. Introduction to Romance Philology. Two credit hours. The year.

203-204. Old Provencal. One credit hour. The year.

***205-206. History of the Literary Movement in France in the First Half of the Nineteenth Century.** Two credit hours. The year.

RURAL ECONOMICS

(Office, Townshend Hall)

PROFESSOR PRICE, MR. PHILLIPS

101. Farm Accounts and Records. Two credit hours. First semester.

102. Farm Management. Four credit hours. Second semester. Two year courses in Agriculture and Horticulture.

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103. Farm Management. Four credit hours. First semester. Four year course in Agriculture.

104. Agricultural Economics. Three credit hours. Second semester.

105. Historical and Comparative Agriculture. Three credit hours. First semester.

107-108. Research Work for Graduate Students. Five to ten credit hours. The year.

SCHOOL ADMINISTRATION

(Office, Room 105, University Hall)

PROFESSOR W. W. BOYD, ASSISTANT PROFESSOR BRICKER

101. The Organization of Public Schools. Three credit hours First semester.

102. The Administration of Public Schools. Three credit hours. Second semester.

103-104. School Hygiene and Sanitation. One credit hour. The year.

105-106. Comparative School Administration. Two to five credit hours. The year.

111-112. The Secondary School. Three credit hours. The year

121. The Teaching of Agriculture in the High School. Two credit hours. First semester.

122. Repetition of 121. Two credit hours. Second semester.

123-124. The Elements of General Agriculture. Three credit hours. The year.

125. Rural Life and Institutions. Two credit hours. First semester.

127. History of Agricultural Education. Two credit hours. First semester.

131. Teaching Elementary Agriculture. Two credit hours. First semester.

132. Repetition of 131. Two credit hours. Second semester.

SHOP WORK

(See Industrial Arts)

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SOCIOLOGY

(See Economics and Sociology)

SPANISH

(See Romance Languages)

VETERINARY MEDICINE

(Office, Veterinary Laboratory)

PROFESSORS WHITE, SISSON, BRUMLEY, AND RICHARDSON,
ASSISTANT PROFESSORS LAMBERT, SCOTT,
DR. SNOOK, DR. HOPPER.

101. **Osteology and Arthrology.** Six credit hours. First year, first semester.

102. **Myology and Splanchnology.** Ten credit hours. First year, second semester.

103. **Angiology, Neurology, Topography.** Eight credit hours. Second year, first semester.

105. **General Pathology and Morbid Anatomy.** Five credit hours. Second year, first semester.

107-108. **Materia Medica.** Five credit hours. Second year, first semester; two credit hours, second semester.

109. **Horse Shoeing.** Three credit hours. Third year, first semester.

110. **Pharmacy.** Two credit hours. Second year, second semester.

111. **Obstetrics.** Three credit hours. Third year, first semester. The instruction in this course consists of fifty-two lectures and demonstrations.

112. **Pathology Laboratory.** Two credit hours. Second year, second semester.

113. **Pathology Laboratory.** Two credit hours. Third year, first semester.

114. **Parasitology.** One credit hour. Second year, second semester.

115-116. **Canine Diseases.** Two credit hours. Third year

118-119-118. **Medical and Surgical Clinics for Small Animals.** One and one-half credit hours. Three semesters.

120. **Principles of Surgery and Clinical Surgery.** Five credit hours. Second and third years, second semester.

121. Canine Surgery. One credit hour. Third year, first semester. Three periods each week.

122. Meat Inspection. Two credit hours. Third year, second semester.

124-123-124. Medical and Surgical Clinics for Large Animals. One and one-half credit hours. Three semesters.

125. Operative Surgery. One credit hour. Third year, first semester. The course consists of practical surgical manipulations performed by students of the third year upon narcotized animals. purchased for the purpose.

126. Theory and Practise of Veterinary Medicine. Five credit hours. Second and third years, second semester.

127. Theory and Practise of Veterinary Medicine. Three credit hours. Third year, first semester.

128. Therapeutics. Two credit hours. Third year, second semester.

130. Ophthalmology. One credit hour. Third year, second semester.

149. Veterinary Anatomy. Three credit hours. Second semester.

150. Veterinary Hygiene and Sanitation. Three credit hours. First semester.

ZOOLOGY AND ENTOMOLOGY

(Office, Room 1, Biological Hall)

PROFESSORS OSBORN AND LANDACRE, ASSOCIATE PROFESSOR HINE, ASSISTANT PROFESSOR BARROWS

101-102. Elementary Zoology. Three credit hours. The year.

103. Comparative Anatomy of the Vertebrates: Vertebrates to Birds. Three to five credit hours. First semester. Prerequisite, Course 101-102, or equivalent.

104. Comparative Anatomy of Vertebrates: Birds and Mammalia. Three to five credit hours. Second semester. Prerequisite, Course 101-102, or equivalent.

107-108 Economic Entomology. Three credit hours. The year. Prerequisite, Course 101-102.

109-110. Systematic and Practical Entomology. Three credit hours. The year. Elective in short course in Agriculture. Required in short course in Horticulture. First year.

111. Parasites of Domestic Animals. One credit hour. First semester.

112. **Apiculture.** Three credit hours. Second semester.

113-114. **Special Entomology.** Four credit hours. The year.

119. **Gross Anatomy of the Frog.** Three to five credit hours. First semester.

120. **Embryology of the Frog.** Three to five credit hours. Second semester. Prerequisite, Course 101-102 or 119.

121-122 **Invertebrate Morphology.** Three to five credit hours. The year. Prerequisite, Course 101-102.

125. **Vertebrate Embryology, Karyokinesis, and the Early Development of Amphioxis, Fishes, and Amphibians.** Three to five credit hours. First semester. Prerequisite, Course 101-102.

126. **Vertebrate Embryology: Birds and Mammals.** Three to five credit hours. Second semester. Prerequisite, Course 101-102.

128. **Embryology.** Two credit hours. Second semester.

129-130. **Quantitative Studies in Variation. Heredity and Animal Behavior.** Three to five credit hours. The year. Prerequisite, Course 101-202, or equivalent.

131-132. **Evolution.** Three credit hours. The year. Prerequisite, one year of Zoology or an equivalent. Professor OSBORN.

133. **Comparative Neurology.** Three to five credit hours. First semester. The origin and structure of the nervous system of the lower vertebrates.

134. **Comparative Neurology.** Three to five credit hours. Second semester. The origin and structure of the nervous system of the higher vertebrates.

135-136. **Cytology.** Three to five credit hours. The year. Prerequisite, Course 101-102, 103, 104, or 121-122.

137-138. **Advanced Entomology.** Three to five credit hours. The year. Prerequisite, Course 101-102.

139. **Ornithology.** Two credit hours. First semester. The first semester is devoted to the anatomy of the birds and to the study of museum specimens.

140. **Ornithology.** Two credit hours. Second semester. This semester is devoted to systematic and field work.

141-142. **Research Work.** Subject to be assigned. Five to ten credit hours. The year. Prerequisite. Course 101-102, and the equivalent of 103-104, or 121-122, or 125-126.

143-144. **Seminar.** One credit hour. The year.

145-146. **Teachers' Course.** Two or three credit hours. The year. Prerequisite, Zoology 101-102.

GRADUATE WORK

223-224. Invertebrate Embryology. Three to five credit hours. The year. Korscehlt and Heider used as a basis. Lecture and laboratory. Prerequisite, equivalents of Courses 137-138 or 247-248. Professor OSBORN.

241-242. Research Work. Subject to be assigned. Five or ten credit hours. The year. Professors OSBORN and LANDACRE.

Research problems in development, life history, morphology or taxonomy may be undertaken. For some of these, the opportunities are particularly good at the Lake Laboratory.

247-248. Invertebrate Zoology. Five credit hours. The year. Professor OSBORN.

A detailed study of invetebrate groups with special reference to morphologic features and discussion of their significance in adaptation, phylogeny and taxonomy.

249-250. Vertebrate Embryology. Three to five credit hours. The year. Professor LANDACRE.

An advanced course dealing with the phylogeny, morphogenesis and mechanics of development of the vertebrate embryo. The laboratory work will be devoted to the detailed study of one type of vertebrate.

Both graduate and undergraduate courses in Zoology are offered in the Lake Laboratory during the Summer Session. Students interested should send for the Lake Laboratory Bulletin by addressing the University Editor.

UNIVERSITY OF ILLINOIS-URBANA
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